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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Calcium Biphosphate Inquiry

THE inquiry which has just closed (as a result of which calcium biphosphate of baking powder quality has been added to the Board of Trade list of dutiable chemicals) has once more raised the old question: What is a fine chemical? And once more it has been shown as clearly as possible that there is no definition which will satisfy everybody. Learned counsel suggested a number of definitions which they regarded as perfectly conclusive; to which other learned counsel replied by giving numerous instances which did not fit in with the definition suggested. The method of manufacture, the kind of plant used, the purity, and many other criteria were put forward, only to be heavily bombarded with criticism. The fact is that (without special reference to this or any other particular occasion) it is quite impossible to put forward a definition of a fine chemical which will prove to be, in practice, anything like watertight. To start with, the number of products is so large, and is growing so rapidly, that anybody who supposes that it is possible to group them all in non-communicating compartments must be a very cheery optimist. Moreover, we live in a time of rapid change. Methods and plant are undergoing radical alteration, as is the scale of work; and it becomes more and more difficult to compare the products of to-day with those of yesterday. Perhaps the best line to take is to consider each case on its own merits. In the present instance, the chairman of the committee of inquiry found it necessary to point out to counsel for each side, in turn, that the committee could not consider itself bound by the findings of previous ones. If and when the Safeguarding Act comes up for renewal and revision, it would perhaps be as well if the basis of its working were made more secure than the present one, which leads to a good deal of uncertainty and consequent hair-splitting.

Forthcoming Fuel Conferences

ARRANGEMENTS are steadily proceeding for two unusually important fuel conferences to be held in the autumn—one in London in September-October, and the other in Pittsburgh in November. The World Power Conference in London will sit from September 24 to October 6 at the Imperial Institute; the discussions promise to be of a comprehensive character and will be supplemented by official visits and excursions. A preliminary circular has been issued this week concerning the conditions and privileges of membership, and any reader interested in the matter is invited to communicate with the Secretaries of the Fuel Conference of 1928, 36, Kingsway, London.

With respect to the second international conference on bituminous coal to be held at the Carnegie Institute of Technology at Pittsburgh during the week beginning November 19, it is already announced that between 60 and 70 scientists and fuel technologists from eleven different countries have provisionally accepted invitations either to speak or to read papers. The list includes about forty Europeans, whom Dr. Thomas S. Baker, president of the Carnegie Institute, personally invited during his recent two months' visit to Europe in the interests of the conference. The purpose of this year's congress is similar to that held in 1926, namely, to present the results of the most recent studies of coal that have to do with improved methods of utilisation and combustion. The programme will include discussions on low-temperature distillation, high-temperature distillation, coal tar products, power, smokeless fuel, complete gasification of coal, hydrogenation, pulverised fuel and its new applications, fixation of nitrogen, etc. The British representatives, we learn, are Professor W. A. Bone, Mr. Edgar C. Evans, Mr. H. A. Humphrey (Imperial Chemical Industries), Dr. C. H. Lander (Director of Fuel Research), Dr. R. Lessing (consulting engineer), Sir Alfred Mond, Mr. Harold Nielsen (Sensible Heat Distillation, Ltd.), Dr. E. W. Smith (technical director of the Woodall-Duckham Companies), and Mr. F. S. Sinnatt (Assistant Director of Fuel Research). There will be large delegations from France and Germany (whose representatives will again include Dr. Bergius and Professor Fischer), and Italy, Austria, Denmark, Belgium, Russia, and Japan will also be represented,

as well, of course, as the United States and Canada. For the information of those who are interested it may be well to state that the secretary of the conference is Professor Sumner B. Ely, the Carnegie Institute of Technology, Pittsburgh.

Synthetic Motor Fuels

THE reports issued from time to time from Germany continue to speak of rapid progress in the experimental work on synthetic fuels. At the recent meeting of the German Dyestuffs Trust it was reported that the process for the liquefaction of coal had succeeded far beyond expectation. Since last autumn, it is stated, increasing quantities of synthetic petrol have been placed on the market and have found ready acceptance; by the end of the year, it is estimated, 100,000 tons of petrol will have been produced, and in 1929 an output of about double this quantity is anticipated. These results are stated to have been obtained without an extension of the works at Leuna, where the oil is produced by the liquefaction of brown coal or lignite. Having, as it is claimed, established the merits of the process in relation to brown coal, experiments are now to be made in applying the process to hard coal.

From another source we learn that important experiments are being conducted in Germany with a new synthetic motor fuel, manufactured from waste coke-oven gases by the Ruhr Chemical Corporation, a company recently formed by 28 of the leading coal and steel interests of the Ruhr valley. The new fuel is methane gas, and is carried in compressed form in light steel tanks. It is understood that results obtained with it so far have been satisfactory. The methane used is a by-product in the production of synthetic nitrate fertilisers from coke-oven gas, which is the main business of the Corporation. Production of both is on an extremely cheap basis. The processes used are the Casale and Concordia-Linde processes.

Subsidised Nitrate

WHILE the Chilean Government still adhere to their refusal to reduce the export duty on nitrate, they recognise that the competition from the synthetic product has to be met in some other way. From a statement circulated by the Association of Chilean Nitrate Producers, it appears that the Government contemplate subsidising the native industry by a grant sufficient to equalise prices between their own product and that marketed by the synthetic producers. The Potash Syndicate is responsible for the fixing of prices for the sale of synthetic and by-product fertilisers, and the prices fixed by them are usually adopted by most of the European producers. In view of the keen competition between the two interests, it is difficult for dealers in Chilean nitrate to operate confidently without knowing the competitive prices for the next consuming season, and these may not be declared until the end of June, or even later. The decision of the Chilean Government in these circumstances is that in the event of the new season's prices for the main products of the Potash Syndicate being lower than this year's scale, the Chilean Nitrate Producers will receive a bonus proportionate to this reduction.

This decision of the Chilean authorities, while it may tend to modify the competition and put sellers of the natural product on an equality as regards price, cannot be regarded as a fundamental remedy for the difficulties with which the Chilean industry is confronted. Much has been suggested in recent years about the improvement of methods, with the idea of cheapening production and making the natural nitrate industry intrinsically able to hold its own. The Chilean Government's method is a palliative which may serve the purpose in view for a time; the weakness of the plan is that it does nothing towards enabling the natural nitrate industry to compete, on strictly economic terms out of its own resources, with the synthetic industry.

A Too Popular Tour

THE efforts, in which we plead guilty to having taken a modest part, to popularise the visit of the chemical engineers to Canada and the United States next August, have succeeded to an embarrassing degree. It was thought originally that the party might number a comfortable and companionable 75 at the outside, which, joined by another 25 or so on the other side, might be increased to the level hundred. It was pleasant to think in advance of the ample accommodation reserved on the *Megantic* and of that private train which was to be a self-contained hotel on wheels for a complete fortnight with its film or concert room, its lounge and observation cars, its well-equipped bar, private drawing rooms and restful sleeping berths. These contemplations have, alas, been disturbed by reports that the number is double that originally contemplated, that berths on another liner may have to be chartered, that instead of two in a cabin there may be four, and that the private train may too much resemble our morning journey on the Tube. In short, the comfortable party of 75 has become a crowd of some 140. Our prospective hosts anxiously discuss the limits of their hospitality; our prospective steerage companions debate which shall have the lower or the upper berth.

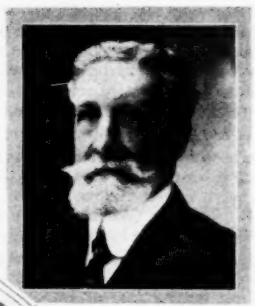
The trouble is all due to the unsuspected generosity of our industrial authorities. Firms now desire their bright young people to join up and offer alluring grants in aid. The Messel Fund sides with the tempters and brings a few more recruits in. The I.C.I. alone, it is said, contemplates a party of over 60. The grain of mustard seed is already a good-sized bush. No doubt, in the end, it will come out all right. It is the function of the chemical engineer to get over difficulties and devise plans that work. But three points may well be kept in mind. Firstly, that the tour is largely a pleasure trip, which will not be improved by overcrowding. Secondly, that hospitality may not be put to an unreasonable strain. Thirdly, that the party are to be received at works and plants as guests on holiday, not as a business delegation of experts.

The Calendar

June 4	University of London: "Chemical Kinetics." Professor Max Bodenstein. 5.30 p.m.	University College.
7	Chemical Society. 5.30 p.m.	Burlington House.
26	National Physical Laboratory: Annual Visit of Inspection. 3 to 6 p.m.	Teddington.

French Chemical Leaders

Ernest CUVELETTE



Rene MASSE

Donat AGACHE-KUHLMANN

Gaston GRIOLET

Edouard LAMY

Paulin GRANDEL

A GROUP OF LEADERS OF THE FRENCH CHEMICAL INDUSTRY—THE PRESIDENT, VICE-PRESIDENTS, AND SECRETARY OF THE WELL-KNOWN ETABLISSEMENTS KUHLMANN.

Nitro-Cellulose Lacquers—An Industry with a Future

By S. Wernick, B.Sc.

The phenomenal growth of the nitrocellulose lacquer industry provides a striking instance of the wide and rapidly multiplying applications of a process once the main technical difficulties of production have been overcome. It is no exaggeration to say that the technical worker is in the main responsible for the success of this industry to-day.

EARLY efforts to produce a satisfactory nitrocellulose lacquer failed on account of the difficulty of producing an ester of more or less standard nitrogen content, and the limited number of available solvents which could be used for its solution. These latter were generally of too volatile a character, and also possessed the unfortunate property of readily absorbing moisture, which inevitably resulted in the clouding or "blushing" of the lacquer after it had been applied. To a certain extent, the viscosity of the lacquer is a function of the molecular aggregation of the cellulose ester, and the problem of producing a nitrocellulose with the requisite degree of molecular complexity to enable a low viscosity lacquer to be prepared from it hindered further progress for some considerable time, since ease of flow is of primary importance in its application to surfaces—particularly in the case of spray lacquers. The only means by which this difficulty was overcome at first was by excessive dilution, the actual nitrocellulose content reaching not much more than four parts per hundred in the most concentrated lacquers. To-day, lacquers may be *sprayed* which have a nitrocellulose content exceeding 20 per cent.

The efforts of chemical manufacturers to supply the needs of the industry by producing suitable solvents—those having a low rate of evaporation and being capable of taking up a certain amount of moisture without precipitating the nitrocellulose—deserve special mention, since this problem has been largely solved through their enterprise by the timely production of special solvents, prepared and tried out in the first place by members of their research staffs. The ideal solvent is one which in addition to other necessary properties will form a constant boiling mixture, and one or two such solvents have been successfully produced and placed on the market.

Growth of the Industry

The industry in this country, although it is growing apace and has reached quite a healthy volume, must still be considered in the infant stage compared with the enormous output which has been achieved in America. In this country, some 20-30,000 gallons of cotton lacquer were produced in 1924, the figure swelling to three times this volume last year. On the other hand, the output in America for 1921 was already not far short of 1½ million gallons, and within four years rose to 11 millions, some 85 factories being devoted to its manufacture at this period! The difference is, of course, in large measure due to the larger field available for its application in the United States, as, for example, in the case of the coloured lacquers absorbed by the automobile industry, which has reached such enormous dimensions in that country. Undoubtedly, as production increases in the home country so will the demand for nitrocellulose lacquers, and there can be no doubt that the future of the industry is assured.

The number of firms in this country which carry out the actual nitration of the cotton can probably be counted on the fingers of one hand, lacquer manufacturers generally contenting themselves with making purchased nitrocellulose the starting point for their operations. Cotton linters are considered most suitable as the cotton material, said to give added strength and toughness to the final film, although tissue paper, canes, grasses, etc., may also be used. The cotton is first cleaned by boiling in caustic soda solution under pressure, and then treated in a stoneware vessel or steel tank with the nitrating liquid. The nitrogen content of the ester, which is so important, is dependent on the concentration and proportions of the nitrating acids (sulphuric and nitric acids) and the temperature at which the reaction occurs: a nitrogen content of approximately 11·5 per cent. is desirable. The product is then put through various processes in order to effect its stabilisation (adhering acids, moisture, etc., being expelled), and is finally treated with methylated spirit, ethyl or isopropyl alcohol under pressure to render it safe for handling and transport.

Other constituents of the nitrocellulose lacquers are resins and plasticisers, which are now incorporated. The former considerably increase the adherence of the film, improve its wearing properties, and also impart a brilliance to the finish, while the latter reduce the tendency to brittleness and impart flexibility to the film. In both cases, manufacturers have concentrated on the production of reliable artificial products to replace the natural substances available, which are too frequently found to be contaminated by impurities (both natural and often deliberately added as adulterants) and also to possess varying properties. Suitable artificial products include glycerinated resin among the resins and tricresyl phosphate among the plasticisers.

Applications

To a large extent, the nitrogen content of the nitrocellulose lacquers determines the purpose for which they are best utilised. Those having a low nitrogen content are best used where a tough film is required. Thus, negative films are obtainable from nitrocellulose having a comparatively low nitrogen content—11·2–11·6 per cent.—while from nitrocellulose of still lower nitrogen content celluloid is obtained by the additional use of camphor and triphenyl phosphate. Nitrocellulose containing nitrogen in excess of 12·5 per cent. is guncotton, and is used in the manufacture of explosives. The solubility of these various types of nitrocellulose in the common solvents increases as the nitrogen content decreases, so that the highest range is practically insoluble, although acetone acts as a more or less general solvent.

Coloured lacquers, which are obtainable by adding the requisite pigment (only a few relatively of these are in regular use), have found wide application in the finishing of exposed metal parts, proving protective as well as decorative and ornamental. They have also been applied successfully in wood-finishing, giving beautiful finishes quite rivalling the ubiquitous French polish.

The colourless lacquers have also come into considerable favour of late as an added protection in metal finishing—particularly subsequent to electroplating. The rapidity and ease of their application as compared with that required in stove lacquering are recognised as effecting considerable saving in time and money, and practically all the better class of electroplate to-day is subjected to a final application of "cold" lacquer. On nickel and silver finishes it is, of course, essential that the lacquer shall be as near as possible really transparent and colourless, since a considerable darkening in the finish otherwise results; colourless lacquers, in particular, must therefore be free from impurities and traces of the nitrating acids. In addition, a relatively high acid content may actually result in the metal itself suffering local attack by chemical action. In one case in the author's experience, a persistent corrosion trouble was traced to this cause, and ceased when a lacquer was specified with an acid content not exceeding 0·01 per cent.

Protection Against Corrosion

Properly applied, such a lacquer will not only enhance the appearance of a metal finish, be this electroplate or the so-called "oxidised" finish, by adding to the gloss, but it is of considerable value in protecting the underlying metal from corrosion. Particularly is this the case if the article is not subjected to considerable abrasion, since in effect the lacquer acts as a seal, completely screening the metal from the action of the atmosphere. Minute pores which are almost inevitably present in the electroplate and are the potential seats of local corrosion are in this way effectively covered and protected.

Provided proper precautions of an ordinary nature are taken, such as apply in the manufacture of any inflammable material, no special risks are involved in the manufacture of nitrocellulose lacquer. The material must, of course, always be in a wet state during handling, *i.e.*, in contact with acid, washing liquids or alcohol, and only becomes a potential danger when dry. Safety devices are, of course, advisable. Thus, motors should be of the enclosed type; oil switches should be used where possible; and the whole of the plant should be earthed as a safeguard against lightning. That the

manufacture does not present any special element of risk provided sensible precautions are taken is shown by the comparatively few cases in which serious accidents have been known to occur.

Conclusion

There is every reason to believe that the nitrocellulose lacquer industry is destined to undergo considerable expansion in the near future, and provided prospective manufacturers do not allow themselves to be rushed into the use of inferior materials in the attempt to secure large returns too quickly, there is no reason why the industry should not be one of the most prosperous of those devoted to metal finishing.

Calcium Biphosphate Inquiry

Duty to be Charged on Imported Article

On Friday, May 25, the inquiry into the application for the inclusion of calcium biphosphate of baking powder quality in the Board of Trade list of articles chargeable with duty under the Safeguarding of Industries Act (Part I), came to an end. The chairman, after an adjournment of half an hour, said that the committee had come to the decision that calcium biphosphate of baking powder quality was a fine chemical, and should be included in the list of the Board of Trade. No reasons were given for the decision.

The earlier proceedings have been reported in THE CHEMICAL AGE from time to time, the last report being given last week. The committee consisted of Mr. A. A. Hudson, K.C. (chairman), Professor J. F. Thorpe, F.R.S., and Professor F. G. Donnan, F.R.S. The complaint was made by A. Boake Roberts and Co., Ltd., supported by Albright and Wilson, Ltd., both of whom are manufacturers of calcium biphosphate, and who claimed that it should be included in the list of dutiable articles on the ground that it is a fine chemical. They were represented by Sir Arthur Colefax, K.C., and the Hon. Stafford Cripps, K.C. There was opposition by Chas. Page and Co., Ltd., and David T. Boyd and Co., Ltd. The opponents were represented by Mr. J. Whitehead, K.C., Mr. Kenneth Swan, and Mr. R. J. Parry. The Board of Trade was represented by Mr. Trevor Watson.

Evidence for the Opponents

On Thursday, May 24, Mr. E. J. Parry, B.Sc., F.I.C., who had given evidence on behalf of the opponents, was cross-examined by Sir Arthur Colefax with regard to the proposition made by the opponents that, broadly speaking, fine chemicals were the pure chemicals, and heavy chemicals were less pure, although there were admittedly exceptions to that rule.

Mr. W. G. Wilson (a director of Chas. Page and Co., Ltd., chemical merchants), gave evidence, and said he was not familiar with the expression "acid calcium phosphate of baking powder quality" prior to this application. As a matter of fact, he had first seen the expression in the *Board of Trade Journal* in connection with this application, and had had to think for a moment as to what it meant. He had dealt with the high-grade calcium biphosphate (80 per cent. strength) and the 50 per cent. strength, and also to a small extent with what was known as the "old standard." The latter was the material which complied with Dr. Hamill's recommendations to the Local Government Board in 1911, i.e., that the maximum calcium sulphate content should be 10 per cent. The use of that grade of material was dying out every day, but there were still a few diehards among the small millers in the north of England.

About 95 per cent. of the new generation used the 80 per cent. or 50 per cent. strength, which had less than 2 per cent. of calcium sulphate, and his firm sold it as containing a maximum of 2 per cent. calcium sulphate. The quantities sold varied. One of his customers (a consumer) took 20 tons at a time, several took 15 tons, and others took smaller quantities, down to 5 cwts. and quantities of that sort. The material was sent out by his firm in 325-lb. barrels and in 1-cwt. kegs. Professor Thorpe asked what was the origin of this material. Mr. Wilson replied that it was American.

Mr. Wilson, referring to the British firms, other than Boake Roberts and Co. and Albright and Wilson, who were said to manufacture calcium biphosphate, said that Perry and Hope, of Glasgow, were the pioneers in the manufacture of this material in England. They were heavy chemical manufacturers. Alexander Cross and Sons, of Glasgow, were primarily acid and fertiliser manufacturers.

Professor Donnan said the committee would like to know what quantity of calcium biphosphate, on the average, was made by these firms. Mr. Cripps pointed out that Albright and Wilson manufactured a good deal more than half of the total.

Mr. Wilson, continuing his evidence, said he bought his calcium biphosphate from one source in America—the Victor Chemical Works, Incorporated, of Chicago. He handed to the committee figures relating to his firm's importation of this material during the past two years. Asked if he would agree that of the total quantity consumed in this country, including all that was imported, more than half was made by Albright and Wilson, witness said he doubted it. Undoubtedly Albright and Wilson produced something approaching half of the total quantity produced by English manufacturers.

A Cream of Tartar Substitute?

Mr. Swan, addressing the Tribunal on behalf of the opponents on Friday, May 25, recalled how Mr. Cyril Atkinson, the referee who heard the previous cases, had laid down certain general principles upon which he came to his decisions in arriving at whether a substance was a fine chemical or not, and these general principles were the trade use of the particular name, purity, method of manufacture, method of marketing, price, and the use to which the substance was put. Mr. Atkinson had decided that cream of tartar was not a fine chemical, and he contended that the evidence proved beyond doubt that calcium biphosphate of baking powder quality was indistinguishable in its use from cream of tartar, and, indeed, was a substitute for it. Mr. A. A. Hudson (chairman) said it was very difficult to look into the previous decisions, which were not in any way binding upon the present Tribunal, and were decisions as to facts which the present Tribunal knew nothing about. In these circumstances, he felt it rather difficult for his colleagues and himself to pay very much attention to the decisions of Mr. Atkinson.

Sir Arthur Colefax, making the final speech on behalf of the applicants, said that there was no justification for differentiating between phosphoric acid, calcium biphosphate, tri-calcium phosphate, or mono-acid phosphate, and yet the other three substances were all in the list. The case was unique in that the Board of Trade had taken the substance out of the list in the belief that it necessarily followed that they should do so after the cream of tartar decision, but he contended that it was idle to try and come to such a decision based upon what had happened in another case where the facts were different.

The decision of the committee is given above.

Board of Trade Announcement

Following the end of the inquiry, the Board of Trade, on May 29, made the following announcement:—The Tribunal appointed under Section 10 (4) of the Finance Act, 1926, to hear the complaint that calcium biphosphate (baking powder quality) has been improperly excluded from the lists of articles chargeable with duty under Part I of the Safeguarding of Industries Act, 1921, has awarded in favour of the complainants. Calcium biphosphate (baking powder quality) will accordingly be added to the list, and will be chargeable with duty on importation as from June 4.

Lead Tetraethyl Inquiry

A MEETING of the Lead Tetraethyl Inquiry Committee was held at H.M. Office of Works, on Friday, May 25, under the chairmanship of Sir Frederick Willis. The Committee conferred with Surgeon-General Cumming, the head of the Public Health Department of the United States of America, and Dr. Leake, one of the senior officers of that Department, on certain points in the evidence given by former witnesses. It was stated that extensive researches had been conducted in America to ascertain whether there was any danger of lead poisoning becoming apparent in persons using ethyl petrol, and these matters were fully discussed. The next meeting will be held on Wednesday, June 6, when evidence will be given by Sir William Pope, F.R.S., Professor H. B. Baker, F.R.S., and Professor Finch.

Imperial Chemical Industries

Great Attendance at First Annual Meeting

THE first annual meeting of Imperial Chemical Industries, Ltd., held at the Hotel Cecil, London, on Thursday, was a remarkable spectacle in its size and unanimity. Every seat in the large hall was occupied some time before the time announced for beginning, and still shareholders kept pouring in. The stream was diverted to the gallery and the boxes, but still showed no signs of exhaustion. Finally, large numbers of shareholders, finding no sitting room and not allowed to stand, sat down contentedly on the floor carpets until the floor space also was occupied, and so listened, Eastern fashion, to the proceedings that lasted over an hour and a half.

The central feature of the meeting was a masterly review of the company's operations by Sir Alfred Mond, who presided and spoke for 70 minutes. Next to this came the concise and informative statement of Sir Harry McGowan, the deputy-chairman, dealing in more detail with matters of practical organisation. Both statements revealed an impressive grasp of the details of the vast concern, and indicated the degree of efficiency to which its centralized organisation has already been brought. Both were received with obvious satisfaction by the shareholders, and the questions included none of substantial importance.

The reports were adopted, with the dividends recommended by the directors, of 8 per cent. on the ordinary shares and 1¾ on the deferred. The retiring directors (Lord Colwyn, Mr. E. J. Solvay, Dr. G. C. Clayton, M.P., Lord Ashfield, and Mr. H. J. Mitchell) were re-elected directors. It was announced that Sir Josiah Stamp, on his appointment as a director of the Bank of England, had retired from the Board and Lord Weir had consented to take his place.

A resolution was passed authorising the increase of the capital to £75,000,000 by the creation of 20,000,000 new shares of 10s. each, and a separate meeting of the preference shareholders adopted a resolution sanctioning the issue of half of the new capital as preference shares.

Sir Alfred Mond's Review

Sir Alfred Mond, in moving the adoption of the report, congratulated the shareholders on the fact that the results of the first year's business had exceeded the directors' estimate, and announced that over 99 per cent. of the shareholders in the merger companies had exchanged into I.C.I. shares. The company had not, he said, been able to reach in the first year all the benefits hoped for from centralisation, unification, selective manufacture, and economic distribution, but they had made immense progress, which would be accelerated when they went into their new headquarters building—Imperial Chemical House. On the subject of relations with foreign interests, he playfully alluded to the fanciful rumours about interviews and negotiations that had never really taken place, and announced in emphatic terms that that company, as guardians of the safety of the nation and of chemical developments in this country, would never enter into any agreement or arrangements that would hamper or imperil the interests of this country or the Empire. On the subject of synthetic fertilisers, he had no doubt of the further scope for this industry, and predicted that even if prices fell further there was a good margin left. Nitric acid and methanol he mentioned as among the new products at Billingham, and he added that he had just seen the first sample of petrol made on a small scale from Durham coal. He was satisfied that a technical solution of this problem could be found, and the Chancellor's duty of 4d. a gallon had helped the solution of the commercial problem.

Sir Harry McGowan gave a most favourable report on the work of the year and the prospects at home and overseas, testified to the efficiency and loyalty of the entire organisation, and mentioned, as illustrating the policy of establishing local manufacturing plants, that in Australia they were installing an experimental plant for the production of synthetic fertilisers. In the chief branches of heavy chemicals, explosives, dyestuffs, metals, and cellulose products, the prospects were all excellent.

Diatomaceous Earth

A Review by the Imperial Institute

THE Imperial Institute has issued, in its series on "The Mineral Industry of the British Empire and Foreign Countries," a pamphlet on *Diatomaceous Earth* (H.M. Stationery Office, pp. 55, 1s.). Diatomaceous earth (a siliceous aggregate of the skeletal remains of diatoms) is known by a large variety of other names, e.g., kieselguhr, diatomite, etc. (the name "infusorial earth," which is sometimes used, is incorrect). It is used for heat- and sound-insulation, for filtration, as a filler for rubber, cement, etc. Small amounts are employed for absorbent purposes and as a packing around bottles containing dangerous chemicals, as a carrier for nickel catalyst in the hydrogenation of oils, as a mild abrasive, in the finishing of cotton piece goods, and for chemical purposes such as the manufacture of ultramarine and matches. Formerly it was employed to a large extent as an inert adsorbent in dyamite manufacture, but it has now been almost entirely superseded for this purpose.

As a filtering agent the earth is used in the manufacture of "candles" of the Berkefeld type, as solid plates and beds, and also in the form of powder added to the liquid to be filtered in many types of filter-presses. It is especially employed in clarifying cane sugar, certain oils, fruit juices such as cyder, wines, preserves and gelatine, and in the filtration of chemicals which would destroy a more soluble medium.

Statistics of Production

The world's production of diatomaceous earth is probably of the order of 100,000 tons per annum, but returns are very incomplete. The United States produces about 70 per cent. of the whole (77,791 long tons in 1926) and consumes the greater part of its output; Algeria comes second in output (about 10,000 long tons per annum), Russia third, and Germany fourth. The chief consuming countries are the United States, Germany, the United Kingdom, and France. There are no important deposits in England and Wales, but there are deposits of considerable economic importance in Northern Ireland, and deposits in Aberdeenshire, and Skye in Scotland, were worked intermittently till 1915. The Irish product is not of a very high quality, but owing to its nearness to the consumers it can be sold in the United Kingdom at a lower price than almost any other variety (except, perhaps, Algerian). It enjoys a considerable sale, especially in the north of England. Imports of diatomaceous earth into the United Kingdom amounted to 5,775 long tons in 1925 (21 long tons from the British Empire), and 9,060 long tons 1926 (36 long tons from the British Empire).

Sulphuric Acid in Australia

THE earliest sulphuric acid plant erected in South Australia in conjunction with metallurgical processes was at Wallaroo smelting works, for the utilisation of the waste gases from roasting sulphide ores of copper. This plant, of the chamber type, had a capacity of about 150 long tons of 60 per cent. acid per week, and continued in operation from 1901 till the cessation of productive operations by the Wallaroo and Moonta Co., in 1923. A portion of the acid produced was utilised in connection with flotation and leaching operations, and in electrolytic refining of copper, the rest being delivered to the adjacent plant of the Wallaroo-Mount Lyell Fertilisers Co. for utilisation in the manufacture of super-phosphates. Apart from this, prior to the establishment of the Electrolytic Zinc Co., of Australasia, works in Tasmania, practically all the acid required in South Australia was manufactured from crude imported sulphur, and some plants are still using that material. With the successful development of the zinc industry at the Electrolytic Zinc Co.'s works, Risdon, Tasmania, blende roasting plants were erected at Port Pirie, Birkenhead, and Wallaroo, South Australia, as well as at Broken Hill and Cockle Creek, New South Wales, for the double purpose of meeting the demand for zinc calcines and of providing sulphur dioxide for sulphuric acid manufacture. In these plants the material roasted is zinc concentrate produced by the Broken Hill group of mines, and the complete elimination of the sulphur is not aimed at, but it is reduced from an average of about 31 per cent. to 5 or 6 per cent. At the Birkenhead and Wallaroo plants the chamber process is used for manufacturing the acid, whereas at Port Pirie the contact process has been adopted.

Safety First in Chemical Works

By F. Grove-Palmer, A.I.C.

In studying some statistics of injuries received by operatives in chemical works, it is interesting to note that, contrary to what might, perhaps, have been expected, the newly-arrived workers in the various departments concerned suffered to a smaller extent than did the older and more experienced hands. The reason for this is not, of course, far to seek: the freshly taken on men and women are more likely to take care of themselves in the presence of unfamiliar machinery than are the older workpeople, who are apt to grow careless with familiarity.

On classifying and analysing some figures concerning such accidents, the following results, expressed in closely approximate percentages, were found:—

Length of Service.	Percentage of total accidents.
One year or over	66
Six months to one year	13
Three to six months	11
Under three months	10

A large number of those included in the first category had been employed in the departments in which they met with the accidents for many years, while amongst those in the last class, numbers had been working in other parts of the factory prior to their transference to that in which they received injury.

It is evident from the table given above that it is very important to keep the "Safety First" warnings prominently in the minds of the older workers, as well as in the case of the new comers, and for this purpose it will be to the good of owners and workers alike, if some method can be found of keeping the need of caution constantly alive in their minds. One plan for avoiding indifference is to have a number of sets of notices of various patterns and colours which may be put up from time to time in place of those already in position. In this way the attention of the established workers will be drawn to the warnings by reason of their freshness. Even if the thought evoked by their appearance is only "Hallo, there's that lot back again," it has succeeded in calling attention to the notices, which was the result desired.

Another excellent device, which is also founded upon the psychological effect of variety upon the senses, is to move the warnings periodically from their usual positions to other places not very far distant but far enough to make the change noticeable. By this simple means, the worker's eye in the first place sees that the old spot is vacant and then instinctively looks elsewhere, or he finds the old notice in a fresh place, reads it, and wonders why it has been shifted. In other words, he thinks about it, and the object has been attained: the warning notice has been read. From every point of view it is essential that the habitués of every department should not be allowed to grow stale to the potential risks about them.

The John Benn Hostel Ballot

THE preliminary arrangements for the Ballot in aid of the John Benn Hostel, in the East End of London, referred to in our last issue, are proceeding satisfactorily, and the result of the appeal for the prizes is very gratifying, and gifts of ballot prizes are still coming in. Further articles from well wishers will be gratefully acknowledged. There is an important way in which all readers can help to make the Ballot a success, and that is by the sale of tickets. Firms or individuals who will assist in this direction are earnestly asked to send their names to the Ballot Organiser, c/o Sir Ernest Benn, Bouverie House, Fleet Street, E.C.4, and are assured that their help will be warmly appreciated.

Sulphate of Ammonia Home Prices

NITRAM, LTD., Victoria Station House, London, announce that they have decided to continue selling neutral sulphate of ammonia, basis 20·6 per cent. nitrogen, for home agricultural use during the month of June at the current price of £10 13s. per ton, delivered carriage paid in 6-ton lots and upwards to buyer's nearest station, or ex works in one-ton lots and upwards, all other terms and conditions as per their circulars 2/28 N and 2a/28 N.

Review

THE CHEMISTRY OF LEATHER MANUFACTURE. By J. A. Wilson. Second Edition. Volume I. New York: The Chemical Catalog Co. Pp. 495. $10.

Of all natural colloids, gelatin has been the subject of the most extensive investigation. For leather chemistry the importance of this work is enormous, as the main components of hide-substance are bodies closely related to gelatin. This volume bears everywhere signs of the painstaking researches of colloid chemists and their applications to the various processes connected with tanning. It contains a wealth of detailed information, and places the reader in a position from which he can regard critically the efforts of the author. Bacteriological and microscopical evidence are also brought forward in the elucidation of the changes occuring in the treatment of animal skins. The text is divided into fourteen chapters, dealing with the physical and chemical characteristics of skins; their preservation, disinfection, and handling preliminary to tanning; the chemistry and evaluation of tanning materials; micro-organisms and enzymes; the physical chemistry of proteins; and acidity and alkalinity as related to leather.

Although tanning is one of the oldest industrial arts, its association with chemical theory is only recent, the reason being that hides and leather are typical colloids, and that colloid chemistry is a young science. Modern tanning aims at mass production, speed, and cheapness, and the only way of achieving this and obtaining good leather is the application of ultra-scientific methods of the nature described in this volume. Every tannery of the future will have to obtain the services of a qualified chemist, as it is impossible for anyone not possessing the necessary scientific training to produce to specification some of the leathers which are now demanded, e.g., beltings, cups for pumps, leathers for tropical and arctic conditions, leather from hitherto unused hides, and, last but not least, leathers demanded by the rapid changes of fashion. Here tradition frequently fails, and science alone can lead to rapid success. Mr. Wilson has treated the subject on the lines of such scientific methods, and in doing so has performed with great distinction a difficult task. Much of his original work is included in the text, and will be appreciated by all progressive chemists and tanners. Some of Mr. Wilson's ideas are debatable, for example, his own method of valuation of tannins; but, nevertheless, his treatment imparts interest to a very prosaic subject, and thus stimulates thought and assists in the absorption of information.

S. P. S.

Education and Industry

MR. M. I. KOSTER, of 83-91, Great Titchfield Street, London, W.1, writes:—"With reference to the recent announcement made by the President of the Board of Education it is interesting to note that special inquiries are to be made into the organisation of technical education. Thirty years of industrial and commercial experience at home and on the Continent have convinced me that if we are to hold our own with the United States and Germany we must possess an adequate training in science, and this we can only acquire by the adoption of compulsory chemistry. Technical knowledge is based ultimately on chemistry, which is the pivot of all our industries. The impetus which compulsory chemistry will give to our arts, industries, commerce and science, and the quickening which will result in our moral and intellectual life are simply incalculable. Our descendants will only wonder why compulsory chemistry was not adopted at a much earlier date."

Hamburg Phosgene Disaster

IN connection with the explosion of a tank containing liquid phosgene, resulting (as reported in these columns last week) in the deaths of eleven people and injury to many others, at Hamburg, no explanation has yet been given of the origin of the supplies of phosgene. It seems, however, that the gas may have been part of the original German war-supplies, in course of disposal. It is considered unlikely that there will be a League of Nations inquiry into the matter. The I.G. (probably as a result of suggestions made in Germany) has issued a statement denying any connection either with the phosgene store or with Dr. Stolzenberg, who was in charge.

C

Inflammability Limits of Gases

A Bureau of Mines Investigation

A STUDY of the limits of inflammability of a large number of gases and vapours has been made by the United States Bureau of Mines, Department of Commerce. A knowledge of the limits of inflammability of methane, and indeed of the products of distillation of coal, in air and in partly vitiated atmosphere, is of fundamental importance in the study of mine explosions and their prevention. Likewise, a knowledge of the inflammable limits of gasoline and benzol vapours, natural and manufactured gas, blast furnace gas, hydrogen, acetylene, and many other gases is of equal importance in the prevention of gas explosions and fires in the metallurgical, petroleum, gas manufacturing, and related industries. Substances that a short time ago were found infrequent, even in the laboratory, are being used on a large scale, and some of them form dangerously explosive mixtures with air. Data concerning their limits of inflammability are widely scattered in the literature, and many of the figures seem contradictory. The results of the Bureau's comprehensive survey have been published in Bulletin 279, by H. F. Coward and G. W. Jones.

An inflammable mixture of gases, such as methane and air, may be diluted with one or the other of its constituents or with other gases until a composition is reached which is no longer inflammable. The dilution limit of inflammability, or simply the limit of inflammability, is the border-line composition; a slight change in one direction or the other produces a mixture which is accordingly inflammable or non-inflammable. There are clearly two limits of inflammability, a higher and a lower, for each pair of so-called combustible gas and supporter of combustion. The lower limit corresponds with the minimum amount of combustible gas; the higher, or upper, limit with the maximum amount of gas capable of conferring inflammability on the mixture. For example, for methane-air mixtures these limits under normal conditions are approximately 5 and 14 per cent. methane, respectively; compositions between these figures liberate enough energy on combustion of any one layer to ignite the next layer of unburned gas, and are therefore capable of self-propagation of flame; others are not. Mixtures richer than 14 per cent. methane, however, may burn on contact with external air, for other mixtures which are inflammable, containing between 5 and 14 per cent. methane, are thus formed.

The experimental determination of limits of inflammability is more difficult than may be anticipated, as is shown by the contradictory figures reported from time to time. It is the object of this bulletin to present the results of a critical review of all figures published on the limits of inflammability of combustible gases and vapours when in admixture with air, oxygen or other "atmosphere." Suspended dusts and liquid mists are not considered. Copies of Bureau of Mines Bulletin 279, "Limits of Inflammability of Gases and Vapors," may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a price of 20 cents.

Illuminating Gas from Lignite

Interesting German Possibilities

THE proposals to supply German industries and towns with gas from the coking plants of the Ruhr coalfields, up to distances of 200 miles, by means of pipelines, have given rise to other schemes for central gas production and long distance distribution. One of the most-discussed of these schemes is to make gas from the brown coal (lignite) of middle Germany for the supply of a large part of Germany. It has lately been demonstrated that it is feasible to obtain a high-grade lighting gas from lignite, the importance of this being the fact that lignite is exceedingly cheap compared to ordinary coal. The possibility of using lignite as a source of gas has not only been established, but the methods for gas production have also been investigated. One of these, which is believed to be quite practicable, is described by Professor F. Siedenschnur in the journal *Braunkohle* (April 7 and 21).

Lignite, in the first place, is retorted by a method of internal heating which consists of leading through it in the retort an inert gas at about 500° C., which drives off the valuable lignite oils and tars, and produces a semi-coke. This semi-coke, which still retains some of the less valuable volatile constituents, is then retorted at 900° C. for gas production, and each ton yields approximately 220 cubic metres of gas with a heating value of about 4,000 heat units per cubic metre. The residual coke is still a good fuel for boiler firing or other heating purposes, and thus has considerable value. The first retorting of the lignite produces a coarse semi-coke, and this condition is maintained in the subsequent retorting to produce gas. By briquetting fine or friable lignite, the solid products are still obtained in lump form.

The question remains as to the economic aspect of this method of making illuminating gas on a large scale. It is recognised that the process is more complicated and difficult than that of making gas from an ordinary gas coal, but the great difference in the cost of raw material is in favour of lignite; the amount and good quality of the by products are believed to make the project one of great economic advantage.

Chemical Matters in Parliament

Oil Extraction from Coal

In reply to Mr. Whiteley (House of Commons, May 23), Commodore King stated that the figure of 50 gallons of oil obtainable from a ton of cannel coal referred only to true cannels and not to the "Hoo" or "Bastard" cannels from which less oil was obtainable.

Coal Distillation Literature

Sir R. Thomas (House of Commons, May 24), asked the Secretary for Mines whether the Department of Scientific and Industrial Research had published any general and non-technical guide to all the existing processes of coal distillation; and, if not, would he consider the desirability of issuing one short enough to enable revised editions to be published at frequent intervals?

Commodore King, in reply, stated that no publication of the nature suggested was issued by the Department of Scientific and Industrial Research, nor did the department think that it would be practicable or desirable for them to prepare and issue such a document.

U.S. Production of Potash in 1927

POTASH produced in the United States in 1927 amounted to 76,819 short tons of potassium salts containing 43,510 short tons of potash (K_2O), according to the Department of Commerce of the United States Bureau of Mines. Sales by producers amounted to 94,722 tons of potassium salts containing 49,500 tons of K_2O. The potash materials of domestic origin, sold by producers in 1927, were valued at $2,448,146 f.o.b. plants. About 7,250 tons of potassium salts with an available content of 2,500 tons of K_2O, remained in producers' stocks December 31, 1927. The output increased 66 per cent. in gross weight with an increase of 86 per cent. of K_2O content. The sales of salts increased 84 per cent., with an increase of 98 per cent. in K_2O content. The total value of the sales increased 126 per cent. Stocks remaining in the hands of producers at the end of 1927 were 72 per cent. less than at the end of 1926. The production was chiefly from natural brines in California and distillery residue from molasses in Maryland. Small amounts were also obtained from steel plant dust in Pennsylvania, Steffen's water in Indiana, and glauconite in Delaware. A small amount of alunite was shipped from Marysvale, Utah, but it was not utilised other than for experimental work. The potassium salts imported for consumption into the United States in 1927, according to the Bureau of Foreign and Domestic Commerce, amounted to 730,597 short tons with a K_2O content of 224,973 short tons.

Appointments Vacant

Leather Research Chemist for the New Zealand Tanners' Research Association.—The High Commissioner for New Zealand, 415, Strand, London, W.C.2. June 30.

Reader in Chemistry at East London College.—The Academic Registrar, University of London, South Kensington, S.W.7. June 21.

A Dairy Chemist under the Australian Commonwealth Council for Scientific and Industrial Research.—The Acting Secretary, Commonwealth Council for Scientific and Industrial Research, 314, Albert Street, East Melbourne, Victoria, Australia. August 15.

From Week to Week

THE SOCIETY OF CHEMICAL INDUSTRY IN BASLE, at its general meeting, confirmed the dividend of 15 per cent.

IMPORTS OF ANILINE DYES to British India in March, 1928, increased in value by 900,771 rupees over March, 1927.

A FIRE BROKE OUT on Wednesday at the varnish works of W. S. Jenkins and Co., Kentish Town. The outbreak was overcome after about an hour.

THE FINANCE CO. OF GREAT BRITAIN AND AMERICA, LTD., has moved into its offices at 37, Threadneedle Street, E.C. All correspondence should be sent to this address.

A NEW FACTORY for the production of synthetic nitrogen compounds is to be erected in Limburg, Holland. The state will take all, or nearly all, the material produced.

NOBEL (AUSTRALASIA), LTD., are to commence the erection at Deer Park, Victoria, of a factory for the manufacture of leather cloth. About 200 workers will be employed.

ACCORDING TO A STATEMENT issued by the Federation of British Industries no change is likely in the Dutch tariff policy before 1929. British manufacturers are advised to keep in touch with Holland by means of personal visits.

ROBERT BLAIR FELLOWSHIPS in applied science and technology, value £450, tenable for one year, will shortly be awarded by the London County Council. The last day of application is June 18. Further details appear in our advertisement columns, p. xxiii.

THE CHEM. FABRIK VORM SANDOZ, of Basle, Switzerland, is paying a dividend of 25 per cent. At the general meeting it was stated that the company has brought out new colours, especially for artificial silk. Swiss chemical industry favours the Franco-German arrangement regarding chemicals.

OWING TO THE SERIOUS crisis through which the Belgian match industry is passing, it is announced that a cartel has been formed by all Belgian match manufacturers, and an agreement has been concluded with a Swedish society by which all Belgian firms will in future be able to run on full staffs for five days a week.

THE WHOLESALE PRICES INDEX FIGURE for chemicals in Germany during March was 125·6, taking the average in 1913 as 100. In Belgium the figure was 701 (the average in 1914 being 100). In Italy the figure was 435·1 (the average in 1913 being 100). In the United States the index figure was 95·6 (the average in 1926 being 100).

THE OFFICIAL REPORT on the condition of the Russian chemical industry states that in 1925–6 the chemical industry had drawn on all its resources, which were practically exhausted, the equipment being worn out. The workers drifted into other industries. The cost of production increased as production declined, one of the reasons being the lack of trained staffs. Foreign plant was installed, in many cases without the corresponding technical hands.

AT THE ANNUAL MEETING of the Anglo American Oil Co., Ltd., on Wednesday, it was stated that since the beginning of the year, and after consultation with the Government authorities concerned in this country, Pratt's ethyl petrol was placed on the market and met with an immediate success. Since then, sales had been adversely affected by the publicity campaign in certain newspapers, but the directors had every confidence that the Government inquiry now proceeding would confirm everything that had been claimed for the product.

RUSSIAN CHEMICAL INTERESTS, in addition to their agreement with the I.G., have also come to an understanding with the German Nitritfabrik A.-G. The electricity organisation known as the Dnjeprostroj is planning the erection of a large calcium carbide works, and in connection therewith a factory for the manufacture of synthetic acetic acid. On the other hand, it may be assumed that it will be necessary to proceed cautiously with this scheme, as the cheapness of wood in Russia points to the production of acetic acid by wood distillation. It is believed that the production of synthetic methanol will also be undertaken.

AT AN ORDINARY SCIENTIFIC MEETING of the Chemical Society on Thursday, June 7, 1928, at 5.30 p.m., the following papers will be read:—"Studies of Valency. Part X. Electrometric titration of Vernon's α and β-dimethyltelluronium bases," by F. L. Gilbert and T. M. Lowry; "Studies of Valency. Part XI. Molecular conductivities and extinction-coefficients of derivatives of cyclotelluropentane," by F. L. Gilbert and T. M. Lowry; "The action of diazo-salts on aromatic sulphonamides. Part II. The mechanism of the reaction and constitution of the diazo-sulphonamides," by A. Key and P. K. Dutt.

THE BRITISH ENGINEERING STANDARDS ASSOCIATION has recently issued British standard specifications for green oxide of chromium, vandyke brown, vermilion, paste driers, liquid driers, and red lakes. The specifications contain clauses regulating the composition together with standard reception tests for the purchase of these materials; appendices being also incorporated outlining standard methods for carrying out the tests. Copies of these six new specifications (Nos. 318, 319, 320, 331, 332 and 333) may be obtained from the British Engineering Standards Association (Publications Department), 28, Victoria Street, London, S.W.1.

A SOAP FACTORY in full production, 20 miles from London, with modern plant, having a present output of over 35 tons per week, is advertised for sale on p. xxiii.

MR. J. P. HITCHCOCK, lately manager of Bell's United Asbestos Co., Ltd., has been appointed technical adviser to the Burbanks Mining and Investment Trust, Ltd., in London.

THE CAPITAL of the United Molasses Co. is to be increased to £3,000,000 by the creation of 1,000,000 six per cent. cumulative preference shares and 500,000 ordinary shares of £1 each.

THE BRADFORD CORPORATION SEWAGE COMMITTEE has decided to install an ozone air plant at the Esholt sewage work, at a cost of £1,000, to meet complaints about the effluvium from the works.

THE SECOND CONFERENCE on industrial fuel utilisation is to be held in Paris starting on June 23 under the presidency of Professor H. Le Chatelier, at the Conservatoire Nationale des Arts et Metiers.

THE THREE WORKS of the Bristol Gas Co. now produce two and a half million gallons of tar and six and a half million gallons of ammoniacal liquor annually. These are treated for the recovery of by-products at chemical works in Bristol.

THE PRELIMINARY PROSPECTUS of the Birmingham Section of the Tenth British Industries Fair has been issued. It is mentioned that the total floor area is 400,000 square feet under one roof, thus forming the biggest exhibition hall in the country.

MR. E. RUSSELL, B.Sc., F.I.C., has been elected chairman of the committee of the South Western Counties Section of the Institute of Chemistry section for the ensuing session. A summer meeting of the section will be held on June 16 at Exeter.

EXPERIMENTS ARE BEING CONDUCTED in Germany with methane gas as a motor fuel. The gas is made by the Ruhr Chemicals Corporation from waste coke oven gas, and is compressed into light steel tanks. It is understood that so far the results obtained have been highly successful.

THE ENGLISH RIGHTS of a German process for making metal immune against chemical action have been secured by the Power Gas Corporation Co., of Stockton, an associated company of I.C.I. A plant is being set up to work the patent and the Power Gas Corporation have in hand a number of contracts for plant for Synthetic Ammonia and Nitrates, Ltd.

A CONSIDERABLE DEVELOPMENT in the manufacture of artificial fertilisers in France is announced in the report of the Établissements Kuhlmann. The firm has now concluded agreements with several of the largest of the French collieries for the supply of their outputs of surplus coke oven gas. This is to be converted into synthetic nitrogen compounds using the Casale process.

THE DUNSTABLE PORTLAND CEMENT CO. has informed its shareholders that an offer has been made by the Associated Anglo-Atlantic Corporation and the British Cement Products and Finance Co. to purchase the shares at £2, upon the condition that the purchasers are not bound to take less than 76 per cent. of the shares issued and under option. The directors intimate that they have no hesitation in selling their shares and in recommending holders to do so on the terms indicated.

UNIVERSITY NEWS.—*London:* Dr. Percival Hartley has been appointed to the University Chair of Biochemistry tenable at the London School of Hygiene and Tropical Medicine. The title of Reader in Pathological Chemistry in the University has been conferred on Dr. C. R. Harington, in respect of the post held by him as lecturer in pathological chemistry at University College Hospital Medical School.—*Manchester:* The honorary degree of Doctor of Laws in the University was conferred upon Sir Alfred Mond on Wednesday, May 23.

MR. W. L. BAILLIEU, the Australian financier, stated recently that it was the intention of the companies in which he is interested to build a plant for the fixation of atmospheric nitrogen. It is understood that the factory will be attached to the Electrolytic Zinc Co.'s works at Risdon, Tasmania. In all probability the small experimental plant will not be running till 1929, and it is not known when the construction of the larger plant will begin. Mr. Baillieu stated that no time would be lost, and that preliminary investigations would start at once.

THE ITALIAN COMPANIES known as the Societa Sarda di Concinii e Prodotti Chimici, the Societa Veneta Fertilizzanti e Prodotti Chimici, and the Societa Meridionale Ammonia Anonima, all subsidiaries of the Montecatini Co., have recently increased their capital. The capital increase of the Societa Sarda is from 8,000,000 lire to 10,000,000 lire, that of the Societa Veneta from 20,000,000 lire to 40,000,000 lire, and that of the Meridionale Ammonia from 10,000,000 lire to 40,000,000 lire. The Societa Sarda manufactures nitric acid, sulphuric acid and superphosphates; the Societa Veneta, sulphuric acid, superphosphates and sodium bisulphate, while the Meridionale Ammonia is the company which controls the large synthetic ammonia plant at Cotrone, which has recently begun operations.

Obituary

DR. FELIX DEUTSCH, of Berlin, on May 19, aged 70.

DR. SEIGFRIED PFAFF, of the I. G. Farbenindustrie A.-G., formerly for many years with the Actiengesellschaft fur Anilinfabrikation, on May 20.

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The chemistry of road-making. Dr. von Skopnik. *Chemiker-Zeitung*, May 19, pp. 397–398.

Catalysts for cracking processes. H. Pincass. *Die Metallbörse*, May 2, pp. 957–958.

ORGANIC.—Synthesis with diazomethane. III. *o*-nitrophenylethylene oxide and substances derived from it. F. Arndt, B. Eistert, and W. Partale. IV. The reaction between aldehydes and diazomethane. F. Arndt and B. Eistert. V. The reaction of acid chlorides with diazomethane. F. Arndt and J. Amende. *Berichte*, May 9, pp. 1,107–1,118, 1,118–1,122, 1,122–1,124.

A deeply-coloured dimeric ketene. W. Langenbeck and H. Langenbeck. *Berichte*, May 9, pp. 938–942.

Dimethyl peroxide. A. Reeche with W. Brumshagen. *Berichte*, May 9, pp. 951–956. Dimethyl peroxide, $CH_3.O.O.CH_3$, has been isolated in gaseous form. It is explosive.

Contribution to the knowledge of the diazide of anthraquinone. K. Brass and F. Albrecht. *Berichte*, May 9, pp. 983–993.

Miscellaneous

COLLOIDS.—Contribution to the study of colloidal clay. A. Demolon and G. Barbier. *Revue Générale Colloïdes*, February, pp. 29–31 (in French.) A study of alluvial clay and of the viscosity of clay suspensions and their adsorptive power.

The hydrolysis of fats in heterogeneous systems. L. Lascaray. *Revue Générale Colloïdes*, February, pp. 32–44 (in French). This study gives results which may be satisfactorily explained in accordance with the views of Langmuir and Harkins on the structure of interfacial surfaces. It is considered that the reaction occurs exclusively at the surface of separation of the phases.

GENERAL.—Velocity measurements of intramolecular changes in aryl-acyl-halogeno-amines. C. C. J. Fontein. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 635–667 (in English.)

On ergosterin, isolated from a Japanese edible mushroom, *Cortinellus Shiitake*. M. Sumi. *Proc. Imperial Acad., Japan*, March, pp. 116–119 (in English.) Ergosterin isolated from an edible mushroom is identical with that from ergot. On irradiation it gives the usual results.

Preparation of furanethylamine. T. Yabuta and K. Kambe. *Proc. Imperial Acad., Japan*, March, pp. 120–121 (in English.)

The adsorption of iodine by carbon from various mixtures of organic solvents. J. Trividic. *Comptes Rendus*, May 14, pp. 1,358–1,360 (in French.)

Review of the yeast industries. C. Schweizer. *Chimie et Industrie*, February, pp. 214–224; April, pp. 604–616 (in French).

ORGANIC.—The oxidation of stilbenes by the per-acids. J. Böeseken and G. Elsen. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 694–697 (in French.)

The configuration of the α-glycols formed by the oxidation of alkylenes. J. Böeseken. *Recueil Travaux Chimiques Pays-Bas*, May 15, pp. 683–693 (in French.)

Ethyl aminomalonate. R. Locquin and V. Cerchez. *Comptes Rendus*, May 14, pp. 1,360–1,362 (in French.)

WATER.—The treatment of waste water with activated sludge. G. Génin. *Revue Produits Chimiques*, May 15, pp. 321–327 (in French.)

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

289,191. VAT DYES, MANUFACTURE OF. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester, H. M. Bunbury, H. Evans and A. Shepherdson, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, February 9, 1927.

Vat dyes have been obtained by the action of sulphuric acid on dibenzoyl-diamino-dianthrimides, particularly dibenzoyl-4-4^1-diamino-1:1^1 dianthrimide, and dibenzo-4:5-diamino-1:1^{1}idianthrimide. It is now found that improved products can be obtained by the use of an oxidising agent such as sodium perborate, persulphate, or hypochlorite after a preliminary treatment with sulphuric acid. Several examples are given.

289,196. SALTS OF THE ALKALINE-EARTH METALS, PRODUCTION OF, FROM ALKALINE EARTH METAL SULPHIDES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 14, 1927.

Alkaline earth metal sulphides have been treated with ammonium salts in aqueous suspension or solution or by treating the dry mixture with steam. It is now found that alkaline earth metal sulphides can be readily transformed into salts of the alkaline earth metals by trituration with ammonium salts. The grinding process may be effected in an edge mill, and the reaction is accelerated by spraying the mixture with water. The reaction is almost quantitative. The ammonium sulphide liberated may be utilised for the recovery of ammonia. Examples are given of the reaction of barium sulphide with ammonium nitrate to obtain barium nitrate, strontium sulphide and ammonium chloride to obtain strontium chloride, calcium sulphide and ammonium nitrate to obtain calcium nitrate.

289,241. SULPHUR DYESTUFFS, MANUFACTURE OF. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 29, 1927.

This process is for making sulphur dyestuffs soluble in alkali sulphides. The parent materials employed include amino and oxy-aryl compounds and the various derivatives of such compounds which are adapted to be transformed into dyestuffs or are already dyestuffs. These substances are treated with sulpho-cyanogen or an agent yielding sulpho-cyanogen, and the sulpho-cyanogen compound thus produced is converted into the corresponding thiophenol or disulphide. The sulpho-cyanogen compounds serving as intermediate products may be made by treating an amino or oxyaryl compound with a solution obtained by double decomposition between a halide of sulphuric acid and a sulpho-cyanide. The compound containing sulpho-cyanide is boiled with alkali or alkali sulphide to obtain a pure dyestuff soluble in alkali sulphide. If the sulpho-cyanogen compound is changed by boiling with alkali sulphide, a solution is obtained from which by acidification or by passing a current of air, the leuco compound of the dyestuff or the dyestuff itself can be precipitated. In an example, 8-oxy-1:2-naphtho-phenazine suspended in carbon tetrachloride is treated with the product of the reaction of sulphuryl chloride and lead sulpho-cyanide in carbon tetrachloride. The product is filtered off and added to boiling sodium sulphide solution, diluted with water, and filtered. The leuco compound of the sulphur dyestuff is precipitated by the addition of acetic acid. Fibre dyed in a sodium sulphide vat of the substance becomes orange yellow when the leuco compound is oxidised on the fibre, the colour being fast to chlorine. Examples are also given of the treatment of 8:8^1-dioxy-1:2:1^1:2^1-dinaphthazine, tridiphenylamine-methane-hydrochloride and tolusafranine.

289,354. SODIUM SULPHIDE, PROCESS FOR PURIFYING. R. Botson, 301, Boulevard des Invalides, Auderghem-Brussels, Belgium, and Soc. Industrielle des Application Chimiques, Soc. An. I.N.D.A.C., 21, Rue du Congrès, Brussels, Belgium. Application date, November 14, 1927.

The process is for obtaining chemically pure sodium sulphide for photographic use. Crude sodium sulphide is treated in an airtight digester at 4-5 atmospheres until liquefied, and is then treated at 80° C. with 1 per cent. of terpinolene free from tarry products, by which the impurities are precipitated. Water is then added, and the liquor filtered, caustic soda solution is added and the liquor again filtered, and finally concentrated to 50-55 per cent. and crystallised. The product contains no iron, copper, or hyposulphite.

289,370. NITRATE OF LIME, PRODUCTION OF. Appareils et Evaporateurs Kestner, Soc. Anon., 7, Rue de Toul, Lille (Nord), France. International Convention date, May 6, 1927. Addition to 279,037.

Specification No. 279,037 (see THE CHEMICAL AGE, Vol. XVII, p. 622) describes the treatment of limestone in a tower in which a partial vacuum is created at the bottom to withdraw carbon dioxide and facilitate the circulation of nitric acid. It is found that the resistance of the charge to the liquid and gaseous currents tends to increase due to the decrease in size of the pieces of limestone. This may be prevented by mixing with the limestone blocks of sandstone which are unaffected by the acid. The charge rests on an inclined grating so that the sandstone blocks can be withdrawn at the side, and reintroduced with limestone at the top.

289,493. METAL DERIVATIVES OF β-DIKETONES, MANUFACTURE OF. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, and S. Coffey, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, October 28, 1926.

These compounds are obtained by introducing aluminium, iron, nickel, cobalt, manganese, zinc, thallium, chromium, cerium, and thorium into β-diketones containing more than 5 carbon atoms of the type

R.CO.CHR′.CO.R″

in which R and R″ represent hydrocarbon radicles, and R′ represents such a radicle or hydrogen. The cyclic β-diketones are not included, and only those metallic derivatives in which the only atoms or groups attached to the metal are the β-diketone residues are obtained. The compounds may be made by treating the metal oxide or hydroxide with the diketone, with or without a solvent, or the metal may be applied in the form of acetate or other salt, or the metal salt may react with an alkali metal derivative of the diketone, or the diketone may be acted upon by the metal alone or as an alloy. Examples are given of the preparation of aluminium propionyl-acetone, ferric butyryl-acetone, nickel acetyl-mesityl oxide, manganic benzoyl-acetone, zinc, thallium, cerium, thorium, and chromium propionyl-acetone, and several others.

289,544. DYESTUFF INTERMEDIATES, PRODUCTION OF. H. A. E. Drescher, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirling. Application date, January 28, 1927.

Phenyl α-naphthyl ketone is obtained by heating an alkaline earth metal salt of α-naphthoyl-ortho-benzoic acid to a temperature of 300°–330° C. preferably in the presence of calcium hydroxide. The phenyl α-naphthyl ketone is removed by distillation as soon as it is formed by reducing the pressure. Examples are given.

289,556. TREATING OILS AND OTHER HYDROCARBONS TO PROMOTE CRACKING. F. B. Dehn, London. From M. B. Schuster, 404, Buell Avenue, Joliet, Ill., U.S.A. Application date, January 31, 1927.

The cracking of hydrocarbons is facilitated by dispersing through them a colloidal catalytic substance such as bentonite. Bentonite absorbs about three times its volume of water and becomes a jelly-like substance, which is ground or emulsified with the oil before distillation. Bentonite containing iron is preferred for the treatment of high sulphur black oils. Natural oils which are too viscous for transportation through pipe lines are reduced in viscosity by the addition of a natural colloid cracking agent. The bentonite may be previously treated with hydrochloric or sulphuric acid, and heated to

remove organic matter. Colloidal hydrated lime may alternatively be used.

289,564. TRIARYLMETHANE DYESTUFFS, MANUFACTURE OF. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges. Frankfort-on-Main, Germany. Application date. February 1, 1927.

Triaryl-methane dyestuffs are obtained by joint oxidation in alkaline solution of a paraoxy-diaryl-methane or a corresponding hydrol or other para-methylated aromatic oxy-compound, and an aromatic oxy compound. In an example, methylene di-*o*-cresotinic acid and the sodium salt 2-oxynaphthalene-3 : 6-disulphonic acid are dissolved in caustic soda solution, copper sulphate or other oxygen carrier added, and the mixture oxidised in contact with air. Other para-oxy-diaryl-methanes may be used, such as methylene-di-*o*-cresol, methylene-di-salicyclic acid, paramino-oxy-diphenyl-methane and its derivatives, and the unsymmetrical methanes such as 4'-diethyl-amino-3-methyl-4-oxy-5-carboxy-diphenyl-methane or 4'-oxy-3'-carboxy-naphthyl-3-methyl-4-oxy-5-carboxy-phenyl-methane, or the corresponding hydrols. Other examples are given.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—265,948 (Soc. Française de Catalyse Generalisee) relating to catalytic production of methyl alcohol, see Vol. xvi, p. 382 ; 270, 705 (I.G. Farbenindustrie Akt.-Ges.) relating to manufacture of hydrocarbons, see Vol. xvii, p. 64 ; 283,949 (I.G. Farbenindustrie Akt.-Ges.) relating to production of aluminium by fusion electrolysis, see Vol. xviii, p. 31 (Metallurgical Section).

International Specifications not yet Accepted

287,845. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 26, 1927. Addition to 287,050.

Specification 287,050 (see THE CHEMICAL AGE, Vol. XVIII, p. 463) describes 4 : 5 : 8 : 9 dibenzopyrene-3 : 10- quinones which are now converted into vat dyes by treating with a halogenating agent in presence or absence of a carrier. Chlorine gives brighter tints, and bromine gives darker tints than the original.

287,846. ALCOHOLS. E.I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. (Assignees of F. C. Zeisberg, Weldin Road, Wilmington, Del., U.S.A.) International Convention date, March 26, 1927.

Ethyl alcohol is treated at 350° C. and 270 atmospheres pressure with a dehydrating catalyst such as copper obtained by reduction in presence of small quantities of manganese and magnesium oxides, or nickel, cobalt, or iron, mixed with chromium oxide or calcium oxide, or mixtures of oxides such as zinc, magnesium, chromium, or manganese. About half the alcohol is converted into ethyl acetate, normal butyl alcohol and a small proportion of acetaldehyde. Other alcohols may be similarly treated.

287,855. DESTRUCTIVE HYDROGENATION OF CARBONACEOUS MATERIALS. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 26, 1927.

The reaction temperature is regulated by the temperature of the hydrogenating gas used. The preheated gas is passed into a chamber surrounding the contact chamber, and isolated from the outer shell, and is then passed into the reaction chamber through an electric heater.

287,858. DYESTUFF INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 24, 1927. Addition to 281,290, and 287,178. (See THE CHEMICAL AGE, Vol. XVIII, pp. 104 and 495.)

Halogen benzene sulphonic acids and homologues are treated with chlorsulphonic acid at a temperature below 100° C. and the sulphochloride obtained is reduced to the mercaptan, which is then condensed with chloracetic acid to obtain halogen thiglycollic acid. In examples, 1:4-dimethyl-2-chlor-5-sulphonic acid is obtained by sulphonating *p*-xylidine and replacing the amino group by chlorine by Sandmeyer's process ; 1-methyl-5-chlorbenzene-2-sulphonic acid is obtained by treating *m*-toluidine sulphate by the baking process and replacing the amino group by chlorine ; 1:2:3-trichlorbenzene-4- (or 5-) sulphonic acid is obtained from 1:3-diamino-2-chlorbenzene-4- (or 5-) sulphonic acid by replacing the amino groups by chlorine ; these acids are then converted into the sulphochlorides, mercaptans, and thioglycollic acids.

287,908. DYES. I. G. Farbenindustrie Akt-Ges., Frankfort-on-Main, Germany. International Convention date, March 29, 1927.

Monoazo dyes are produced in substance or on the fibre by coupling 2:3- or 2:5-dichloro-4-aminotoluene with an arylide of 2:3-oxynaphthoic acid. Reddish shades are obtained, the dyeings being fast to kier boiling and to light. Examples are given.

287,924. TETRAZOLES. A Boehringer, Nieder-Ingelheim, Germany. International Convention date, March 30, 1927. Addition to 280,529. (See THE CHEMICAL AGE, Vol. xviii, p. 57.)

Amido- or imido-chlorides, *e.g.*, those produced by the action of organic or inorganic acid chlorides on mono-substituted acid amides, are treated with hydrazoic acid or azides to obtain tetrazoles. A solvent such as chloroform and a base such as pyridine are preferably present. Diphenyl-tetrazole is obtained by adding thionyl chloride to benzophenone and hydrazoic acid, and examples are also given of the production of α-β-cyclo-pentamethylene-tetrazole.

288,127. SULPHONATING FATTY ACIDS, ETC. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, April 1, 1927.

Unsaturated fatty acids, their anhydrides or esters are sulphonated by means of a reaction mixture of a low fatty acid or its anhydride and sulphuric acid containing anhydride, *e.g.*, castor oil is treated with glacial acetic acid and fuming sulphuric acid.

288,133. PYRIDINE DERIVATIVES. Schering-Kahlbaum Akt.-Ges., 170, Müllerstrasse, Berlin. International Convention date, March 31, 1927.

2-Pyridone and its derivatives are treated with halogens in the presence of a solvent.

288,148. DESTRUCTIVE HYDROGENATION OF CARBONACEOUS MATERIALS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 31, 1927.

The residues from the treatment of coal, tar, etc., are heated by hot gases or steam in a shaft or rotary furnace, low-temperature producer, metal bath, or in a closed pipe, to a temperature high enough to crack the oils and produce benzines or permanent gases. The oils can be used for making pastes with materials to be destructively hydrogenated.

288,154. NITROGEN, HYDROGEN, AMMONIA. Kali-Industrie Akt.-Ges., and T. Thorssell, 139, Hohenzollernstrasse, Kassel, Germany. International Convention date, April 1, 1927.

Air and steam are passed over iron oxides, the higher oxides being then treated with reducing gases. About one quarter of the reaction proceeds between ferrous and ferric oxides, about one half between ferrous and magnetic oxides, and about one quarter between magnetic and ferric oxides. No separate heat supply is necessary. A nitrogen-hydrogen mixture is obtained for ammonia synthesis.

288,159. BENZODIAZINE CONDENSATION PRODUCTS. I. G. Farbenindustrie Akt. Ges.,Frankfort-on-Main, Germany. International Convention date, March 31, 1927. Addition to 287,179. (See THE CHEMICAL AGE, Vol. xviii, p. 495.)

A homologue, analogue or substitution product of a 2:4-dihalogen and quinazoline is condensed with two similar or dissimilar molecules of a compound which contains a reactive hydrogen atom attached to a nitrogen, oxygen, or sulphur atom to obtain benzodiazines. Thus, 6-intro-2:4-dichloro-quinazoline is condensed with 2-amino-5-hydroxynaphthalene-7-sulphonic acid. The product couples with diazo compounds, and can itself be diazotized and coupled. Other examples are given.

288,171. CHLOROPERYLENES. F. Bensa, 25, Piazza Fontane Marose, Genoa, Italy. International Convention date, April 2, 1927.

Dry chlorine is passed through a solution or suspension of perylene or a low-chlorinated perylene containing aluminium trichloride, or antimony pentachloride. The degree of chlorination depends on the temperature and quantity of chlorine, and hepta- to dodeca-chloroperylenes are obtained. Examples are given.

LATEST NOTIFICATIONS.

290,963. Process for the manufacture of phenol formaldehyde condensation products. Kunstharzfabrik Dr. F. Pollak Ges. May 21, 1927.

290,657. Process of removing iron from the complex salt of sodium glutamate. Oka, K. May 19, 1927.

290,971. Process for the production of phosphorus from ferro-phosphorus. I. G. Farbenindustrie Akt.-Ges. May 21, 1927.

290,636. Process for the manufacture of dyestuffs of the anthraquinone series. I. G. Farbenindustrie Akt.-Ges. May 18, 1927.

290,679. Manufacture of concentrated nitric acid. Montecatini Soc. Generale Per L'Industria Mineraria Ed Agricola. May 20, 1927.

Specifications Accepted with Date of Application

261,029 and 264,466. Urea and its derivatives and formaldehyde, Manufacture and production of condensation products of. I.G. Farbenindustrie Akt.-Ges. November 7, 1925 and January 12, 1926. Addition to 259,950.

270,764. Croton aldehyde, Manufacture of. Elektrizitätswerk Lonza. May 8, 1926.

274,023. Ammonia, Manufacture of. Soc. D'Etudes Minieres et Industrielles. July 6, 1926. Addition to 253,540.

274,904. Catalytic gas reactions. I.G. Farbenindustrie Akt.-Ges. July 24, 1926.

276,302. Distilling liquids, more particularly liquid hydrocarbons Method of and apparatus for. M. Singer. August 19, 1926.

277,938. Carbon dioxide, Manufacture of. P. E. Haynes. September 27, 1926.

278,355. Alloys, and method of working and heat treating same. M. G. Corson. October 4, 1926.

278,672. Alkyl and aralkyl derivatives of diphenolisatines, Manufacture of. F. Hoffmann-La Roche and Co. Akt.-Ges. October 9, 1926.

281,281. Chloroperylene quinones, Process for manufacturing. F. Bensa. November 26, 1926.

284,199. Alkyl ethers of protocatechuic aldehyde, Preparation of. F. Boedecker. January 24, 1927. Addition to 285,156.

289,022. Preservation of latex. I.G. Farbenindustrie Akt.-Ges. April 20, 1927.

287,114. Benzine soaps, Preparation of. I.G. Farbenindustrie Akt.-Ges. November 9, 1925.

290,316. Catalytic oxidation of sulphur dioxide. H. G. C. Fairweather. (*Selden Co.*). January 4, 1927.

290,317-8. Steel, Manufacture of. J. W. Hornsey. January 5, 1927.

290,319. Aldehydes from dicarboxylic acids, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). January 7, 1927.

290,322. Unsaturated hydrocarbons, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). January 10, 1927.

290,377. Depolymerisation products from carbo-hydrates of high molecular weight, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). February 15, 1927.

290,408. Vat dyestuffs of the anthraquinone series, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*). March 24, 1927.

290,421. Red oxide of iron suitable for use as a pigment, Process for the manufacture of. T. Storer and C. J. A. Taylor. April 9, 1927.

290,442. Steel or steel alloys from titaniferous ores and iron sands, Direct production of. F. A. de Silva, and C. G. Carlisle. May 18, 1927.

290,444. Organic metallic compounds, Manufacture of. C. Arnold. (*Standard Development Co.*). May 21, 1927.

290,464. Lactic acid and its derivatives, Manufacture and production of J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 2, 1927.

290,491. Manganese peroxide and other manganese oxides from manganese-containing ores and substances, Production of. K. E. Dittmann, K. Faerber, and Gelsenkirchener Bergwerks Akt.-Ges. September 10, 1927.

290,518. Ammonium phosphate or mixed fertilisers containing ammonium phosphate by bleaching of raw phosphate. F. G. Lilkenroth. July 12, 1927.

290,523. Oxidation of ethyl alcohol. O. Y. Imray. (*S. Goldschmidt*). November 30, 1927.

290,551. Lubricating oils, Manufacture of—by distillation of solid carbonaceous materials. H. Nielsen and B. Laing. December 4, 1926.

290,552. Electrolytic deposition of tin from alkaline solutions. Siemens and Halske Akt.-Ges. October 13, 1927.

290,554. Aqueous solutions of organic compounds insoluble in water, Preparations for production of. I.G. Farbenindustrie Akt.-Ges. October 26, 1926. Addition to 261,720.

Applications for Patents

Barnes, R. S., Harris, J. E. G., Scottish Dyes, Ltd., Thomas, J. and Wylam, B. Dyes and dyeing. 15,059. May 22.

British Cyanides Co., Ltd. Tiling surfaces. 15,049. May 22.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of substitution products of sulphur dyestuffs. 15,051. May 22.

Carpmael, A. Manufacture of basic azo-dyestuffs. 15,191. May 23.

Carpmael, K. [legal representative of Carpmael, W.]. (I. G. Farbenindustrie Akt.-Ges.) and Carpmael, K. S. [legal representative of Carpmael, W.]. Activation of carbon, etc. 15,309. May 24.

Coley, H. E. Reduction of ores, oxides, etc., 15,117. May 23.

Coley, H. E. Apparatus for low-temperature carbonization. 15,118. May 23.

Coley, H. E. Separation of metals from ores, etc. 15,119. May 23.

Coley, H. E. Reduction of ores, oxides, etc. 15,263. May 24.

Coley, H. E. Manufacture of zinc oxide. 15,264. May 24.

Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Réunies Etablissements Kuhlmann. Manufacture of azo dyestuffs, etc. 15,053. May 22. (France, January 19.)

Dehn, F. B., and Flintkote Co. Production of aqueous dispersions. 14,868. May 21.

Dreyfus, H. Manufacture of aliphatic compounds. 15,561. May 26.

Eder, R. Manufacture of polysulphides of aromatic carboxylic acids, etc. 15,029. May 22. (Switzerland, May 27, 1927.)

Hailwood, A. J., and Tatum, W. W. Manufacture of anthraquinone derivatives, etc. 15,566. May 26.

Hardt, A., Hartmann, C., and I. G. Farbenindustrie Akt.-Ges. Manufacture of organic salts of dyestuffs. 15,025. May 22.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Treatment of coaly substances. 14,863. May 21.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of transfer pictures. 14,864. May 21.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of gases rich in olefines from bituminous coals, etc. 14,999. May 22.

I.G. Farbenindustrie Akt.-Ges., ahd Imray, O. Y. Manufacture of artificial materials. 15,028. May 22.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Treatment of paper, fabrics, etc., with chemicals, etc. 15,121. May 23.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture and production of ketones. 15,411. May 25.

I.G. Farbenindustrie Akt.-Ges. Manufacture of physiologically-active substances. 15,167. May 23. (Germany, May 23, 1927.)

I.G. Farbenindustrie Akt.-Ges. Preparing lead electrodes. 15,168. May 23. (Germany, May 24, 1927.)

I.G. Farbenindustrie Akt.-Ges. Desensitizing photographic plates. 15,169. May 23. (Germany, June 15, 1927.)

I.G. Farbenindustrie Akt.-Ges. Destructive hydrogenation of carbonaceous materials. 15,410. May 25. (August 11, 1927.)

Imperial Chemical Industries, Ltd. Manufacture of anthraquinone derivatives, etc. 15,566. May 26.

Synthetic Benzine Production by the I.G.

DURING 1928 the I.G. Farbenindustrie expects to produce 100,000 tons of petrol by the liquefaction of lignite, according to the statement made by Herr Bosch, at the annual meeting of the I.G. Farbenindustrie at Frankfurt on May 24.

Since last autumn, when the I.G.'s synthetic benzine was first placed on sale experimentally in small quantities, increasing amounts had, he said, been put on the market and had been disposed of without difficulty. The construction of the Leuna works for coal distillation purposes was almost completed. In 1929 a further increase to about double that might be expected. The increase output would be possible without a further expansion of the plant, as the I.G. had succeeded, by improvements in the process, in raising its productive capacity to a considerable degree beyond that orginally estimated.

The I.G. now proposed, Herr Bosch continued, to turn its attention in greater measure to hydrogenation of hard coal. The experiments in the extraction of lubricating oils, paraffin, and other products had been continued, and had led to very promising successes. The lubricating oils produced by the I.G. had been used for many months in their own works, and had proved satisfactory.

In pursuance of the agreement reached last autumn with the Standard Oil Co. of New Jersey, the question of the application of the I.G. hydrogenation process in the petroleum industry had been investigated jointly with the American company, which, with the support of the I.G., was erecting an experimental plant in the United States. This plant was expected to be ready in the coming summer.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 6d. to 1s. 11d. per gall.; pyridinised industrial, 1s. 8d. to 2s. 1d. per gall.; mineralised, 2s. 7d. to 2s. 11d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. 3d to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—2s. 8d. to 3s. per gall. 97/99.—2s. 7d. to 2s. 8d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.

BENZOLE.—Prices at works; Crude, 10½d. to 11d. per gall.; Standard Motor, 1s. 4½d. to 1s. 5d. per gall.; 90%, 1s. 5½d. to 1s. 6d per gall.; Pure, 1s. 9d. to 1s. 10d. per gall.

TOLUOLE.—90%, 1s. 7d. to 2s. per gall. Firm. Pure, 1s. 10d. to 2s. 3d. per gall.

XYLOL.—1s. 1d. to 1s. 11d. per gall. Pure, 2s. 4d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; middle oil, 7d. to 8d. per gall. Heavy, 8¼d. to 8½d. per gall. Standard specification, 6¾d. to 7d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9½d. per gall. Solvent 90/160, 1s. 1½d. to 1s. 2d. per gall. Solvent 95/160, 1s. 2d. to 1s. 8d. per gall. Solvent 90/190, 9½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 62s. 6d. to 65s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. per gall. 90/180, 3s. to 4s. 6d. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. 1½d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 11d. to 2s. 1d. per lb. Less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 2½d. to 1s. 4½d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—8s. to 8s. 3d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—11s. 4d. to 11s. 7d. per lb.
BISMUTH CITRATE.—10s. 4d. to 10s. 7d. per lb.
BISMUTH SALICYLATE.—10s. 7d. to 10s. 10d. per lb.
BISMUTH SUBNITRATE.—9s. 7d. to 9s. 10d. per lb.
BISMUTH NITRATE.—6s. 7d. to 6s. 10d. per lb.
BISMUTH OXIDE.—14s. 7d. to 14s. 10d. per lb.
BISMUTH SUBCHLORIDE.—14s. 4d. to 14s. 7d. per lb.
BISMUTH SUBGALLATE.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. 1d. to 2s. 3d. per lb.; potassium, 1s. 9½d. to 1s. 11½d. per lb.; sodium, 2s. to 2s. 2d. per lb.; granulated ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—1s. 2d. to 1s. 3d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. '730—11½d. to 1s. 0½d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 6d. to 2s. 9d. per lb. Green, 2s. 9d. to 3s. 2d. per lb.; U.S.P., 2s. 7d. to 2s. 10d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 16s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.
METHYL SULPHONAL.—9s. to 9s. 3d. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—100s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 4d. to 2s. 7d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 1d. to 2s. 4d. per lb., B.P.C., 1923—2s. 6d. to 2s. 7d. per lb. U.S.P., 2s. 4d. to 2s. 7d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 6½d. to 1s. 9d. per lb. Crystal, 1s. 7d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—10s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—8s. 3d. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. 6d. to 11s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—38s. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—26s. per lb.
BOURBON GERANIUM OIL.—20s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CASSIA OIL, 80/85%.—8s. per lb.
CITRONELLA OIL.—Java, 2s. 4d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. per lb.
CLOVE OIL.—5s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 16s. per lb.
LEMON OIL.—13s. per lb.
LEMONGRASS OIL.—4s. 3d. per lb.
ORANGE OIL, SWEET.—4s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 55s. per oz.
PALMA ROSA OIL.—14s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. per lb.; Japanese, 7s. 3d. per lb.
PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinion.*

Glasgow, May 30, 1928.

THE holiday has to some extent been felt in the Scottish chemical market, whose activity during the past week has not been marked. There has, however, been a moderate amount of inquiry for export. Prices show little or no change.

Industrial Chemicals

ACETONE.—B.G.S., £64 to £67 per ton, ex store, according to quantity.

ACID ACETIC.—98/100% glacial, £56 to £67, per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand, now quoted 7½d. per lb., delivered, but this price could probably be shaded for improved quantities.

ACID CITRIC, B.P.—Rather easier and now offered for spot delivery at 1s. 11½d. per lb., less 5%, ex store, quoted 1s. 11¼d. per lb., less 5%, ex wharf, to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality. £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Now quoted 1s. 4¼d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 10s. per ton c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM LUMP POTASH.—Spot material available at about £9 per ton, ex store. Crystal Meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA ANHYDROUS.—Now quoted 10d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton. Powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Continental about £19 per ton c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £16 15s. per ton c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Offered for prompt despatch from mines at £19 7s. 6d. per ton, ex wharf. Spot material on offer at £20 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 15s. per ton c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers, £6 12s. 6d. per ton delivered, minimum 4 ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton f.o.r. works, or £4 12s. 6d. per ton f.o.b. U.K. ports, for export.

COPPER SULPHATE.—Quoted £24 10s. per ton c.i.f. U.K. ports, but some spot parcels available at somewhat less.

FORMALDEHYDE, 40%.—Quoted £35 10s. per ton c.i.f. U.K. ports. Spot material now on offer at £38 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—Quoted £31 10s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £39 15s. per ton c.i.f. U.K. ports. Brown, £38 10s. per ton c.i.f. U.K. port. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand

METHYLATED SPIRIT.—Industrial quality 64° O.P., quoted 1s. 7d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—4½d. per lb., delivered minimum four-ton lots. Under four-ton lots ¼d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 10s. per ton, ex wharf, prompt shipment from the Continent. Spot material available at £26 10s. per ton, ex store.

POTASSIUM CHLORATE.—99/100%.—Powder quoted £23 10s. per ton, c.i.f. U.K. ports. Crystals 30s. per ton extra. B.P. quality, crystals or powder, offered at £32 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6¾d. per lb.

SODA CAUSTIC.—Powdered 98/99%, £17 17s. 6d. per ton. Solid 76/77%, £14 10s. per ton, and 70/72%, £13 12s. 6d. per ton, minimum four-ton lots, carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—Spot material on offer at about £22 per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works minimum four-ton lots. Under four and over two-ton lots 3 1/16d. per lb. Under two-ton lots, 3⅛d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay; minimum four-ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Quoted £11 per ton, ex store.

SODIUM NITRITE 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE.—Now on offer at 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton delivered. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption. Solid 60/62% £9 per ton. Broken 60/62% £10 per ton. Crystals 30/32% £7 2s. 6d. per ton delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton—ex store. Prices nominal.

ZINC CHLORIDE.—British material 98/100% quoted £24 15s. per ton f.o.b. U.K. ports. 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf, prompt shipment from the Continent.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Canadian Arsenic Production, 1927

THE greater part of the Canadian production of arsenic is obtained from smelting in Canada the ores from the Cobalt district in Ontario. Less amounts are contained in silver-cobalt residues exported for treatment in European smelters. The Nickel Plate gold mine in British Columbia exports to the Tacoma smelter a concentrate containing gold and arsenic. At times, mispickel ores are mined in Nova Scotia, but there was no production from this source in 1927. Prices of arsenic during the first seven months of 1927 averaged 3·75 cents. per pound, rising then to 4 cents during the remainder of the year, as against an average of 3·5 cents. in 1926. The following table has just been issued by the Dominion Bureau of Statistics at Ottawa, indicating production of arsenic in Canada in 1926 and 1927:—

	1926.		1927.	
From arsenical concentrates and residues exported ..	Quantity. lb. 1,090,460	Value. $ 12,687	Quantity. lb. 1,298,421	Value. $ 14,944
White arsenic ..	3,984,217	134,124	4,894,547	196,335
Total ..	5,074,677	$146,811	6,192,968	$211,279

Nitrogen Products

Export.—On account of the very heavy consumption of sulphate of ammonia and the consequent diminution of stocks the market is very firm. There are a few small sellers at low prices, but for prompt shipment the price is about £9 15s. per ton, f.o.b. U.K. port in single bags. It is anticipated that prices for July and August will be lower, but after that date the usual upward move will take place.

Home.—As indicated above, it is not expected that when home prices for the new season are announced they will be lower than the scale for 1927–28. It is not expected that these prices will apply for delivery before August next. The present season is a late one, and orders for sulphate of ammonia are still received from various parts of the country.

Nitrate of Soda.—Producers continue to hold firm for 16s. 6d. per metric quintal, f.a.s. Chile, but very few sales have been reported. When the firmness of the sulphate position is realised, it is likely that buying will take place.

Latest Oil Prices

LONDON, May 30.—LINSEED OIL dull, and 7s. 6d. to 2s. 6d. per ton lower. Spot, ex mill, £31; May, £29 17s. 6d.; June-August, £29 17s. 6d.; September-December, £30 17s. 6d.; and January-April, £31 5s., naked. RAPE OIL quiet. Crude, extracted, £42; technical refined, £44, naked ex wharf. COTTON OIL quiet. Egyptian crude, £34 10s.; refined common edible, £40; deodorised, £42, naked. TURPENTINE inactive, American, spot, 39s. 6d.; June, 39s. 9d.: July-December, 42s. per cwt.

HULL, May 30.—LINSEED OIL.—Spot and May, £29 10s.; June, £29 12s. 6d.; July-August, £29 17s. 6d.; September-December, £30 12s. 6d. per ton, naked. COTTON OIL.—Bombay crude, £30 10s.; Egyptian crude, £33; edible refined, £37; technical, £34 15s.; deodorised, £39 per ton. PALM KERNEL OIL.—Crushed, 5½ per cent., £38 10s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, £39; deodorized, £43 per ton. SOYA OIL.—Extracted and crushed, £33 5s.; deodorised, £36 15s. RAPE OIL.—Crude-extracted, £40 15s.; refined, £42 15s. per ton, net cash terms, ex-mills. TURPENTINE, CASTOR OIL and COD OIL.—Unaltered.

Calcium Cyanamide 19% N

As the season advances, demands for nitrogenous fertilisers are naturally diminishing. Some interest is still being shown in the use of this material for charlock destruction and for application to late crops of roots. The farmers' price for June delivery for four-ton lots remains unchanged at £9 per ton, carriage paid to any railway station in Great Britain.

South Wales By-Products

THE holidays affected South Wales by-product activities, but not to the extent anticipated. Inquiries for most products are on the quiet side and there is no appreciable change in values. Pitch is easy and values are nominal on the basis of 57s. 6d. to 62s. 6d. per ton f.o.b., and 65s. a ton delivered. Naphthas have only a nominal call and prices are unchanged. Solvent naphtha continues to change hands at from 1s. 1d. to 1s. 2d. per gallon f.o.r., and heavy naphtha at from 1s. to 1s. 1d. per gallon f.o.r. Creosote shows a slight increase at from 7¼d. to 8d. per gallon f.o.r. makers' works. Crude naphthalene continues to sell at 80s. per ton f.o.r., and whizzed round about 90s. per ton f.o.r. Refined tars are unchanged, coke oven tar changing hands at from 7¾d. to 8¼d. per gallon delivered, and gasworks' tar at from 7¼d. to 7¾d. per gallon. Crude tar appears to have a steady, but moderate, call at about 50s. per ton f.o.r. Patent fuel and coke exports have decreased, chiefly on account of the holidays, but prices are unchanged. Oil imports into Swansea during the four weeks ended May 22nd amounted to 32,094,243 gallons.

Artificial Silk News

IT is announced that a meeting at Amsterdam of the Enka Co. has approved the creation of 50,000 "D" shares, each of ten guilders, for the purpose of preventing foreign control. A further meeting authorised the board to issue 7,000,000 guilders common stock at such time as the board might judge suitable. The chairman stated that it was not yet certain whether the new shares would be offered for subscription to shareholders or whether the shares would be used for the exchange for new acquisitions.—The I.G. Farbenindustrie A.-G. is now making about 11-12,000 kilos of viscose and cuprammonium silk per day. When all present plans of construction are realised, the daily production will be 22,000 kg. per day.—According to recently published figures Great Britain leads in the production of cellulose acetate silk. The present annual production is as follows:—England, 10,000 lbs.; United States, 3,500 lbs.; France, 2,100 lbs.; Belgium, 1,300 lbs.; Canada, 850 lbs.; Italy, Germany, and Holland, 400 lbs.

Mechanical Handling

A New Development in Great Britain

IN connection with the mechanical handling of all kinds of materials, such as coal, ash, sand, limestone, gypsum, crushed ores and many chemicals, it is interesting to note that The Underfeed Stoker Co., Ltd., have now taken over the sole manufacture and selling rights for Great Britain and the British Empire of the "Beaumont" mechanical handling plant. The field covered is of a most extensive character, and important for the large chemical works in that the wide range of equipment available allows of the right installation being supplied for each individual purpose.

Noteworthy, for example, is the "Beaumont" cable drag scraper for coal storage, applicable to a site of any size or shape, using a cable across the surface of the pile with pulleys attached to suitable posts or a tail block car equipment on rails moved round the outside of the dump and fixed down as required, this cable having attached to it a heavy drag scraper container device or bucket, of about 2,000 lbs. capacity. The coal on arriving at the site is emptied out of the railway wagons or rope conveyors, for example, taken up on to the top of a tower by an automatic skip hoist, and then discharged to the one point of the coal storage area, from which it is distributed by the cable scraper over the whole surface. This is operated by an electrically-driven winding gear, and the coal is easily taken off the pile again by the same apparatus, the bucket being reversed. Standard installations from 20 tons up to as much as 600 tons per hour are available, and the main advantages claimed are flexibility and rapidity in operation, with relatively low capital and operating costs.

Interesting also is the "Beaumont" electrically-driven automatic skip hoist, suitable for all kinds of material, consisting essentially of a steel bucket, overhead track cable, and winch. The whole operation of raising and lowering of the bucket from the ground level, and the conveyance along the track by means of a cable, is controlled by hand from the ground, while the equipment includes a special magnetic brake which holds the bucket dead tight at any point in the travel, for example, or in the event of failure of the electric current. In general, the skip hoist has been rather neglected in Great Britain, but it has many advantages, especially in the way of convenience and low capital cost.

Catalogue of Optical Apparatus

OPTICAL methods are being increasingly used in chemical industry for control and other purposes. Special interest therefore attaches to the publication by Adam Hilger, Ltd., of 24, Rochester Place, Camden Road, London, N.W.1, of a new general catalogue of their manufactures. This volume concerns the instruments contained in sections D, E, F, H, K, L, M and N of the earlier editions of their general catalogue, with certain additions. Of great interest to chemists is section M, dealing as it does with polarimeters; spectro-polarimeters (for measurements of the rotary power for radiations of any desired wavelength); ultra-violet spectro-polarimeters; polarimeter tubes; strain-viewers (polariscope), for determining the presence of strain in glass articles; Twyman's apparatus for determining the annealing temperature of glass; refractometers (Abbe, Pulfrich, Jamin and Rayleigh interference types), etc. Other sections of the catalogue deal with the numerous other products of the firm, among which may be mentioned colorimeters (including the Guild trichromatic colorimeter); the Mutochrome, a device by means of which colours or shades of individual portions of a pattern or design may be changed at will; spectrometers; spectrophotometers, etc. Latterly, many instruments which have hitherto been of pure scientific interest only have been applied to industrial operations. For example, an industrial spectrophotometer (the Hilger-Nutting industrial spectrophotometer) is described, which may be used for the rapid and accurate measurement of hydrogen-ion concentration in plant control work, for determinations of concentration and purity in the dye industry, for the study of paint samples, and for other purposes. The catalogue is written and produced in the clear and interesting style characteristic of the publications of Adam Hilger, Ltd., and is well worth perusal.

Company News

TATE AND LYLE.—An interim dividend of 4 per cent., less tax, is announced.

SHAWINIGAN WATER AND POWER.—A dividend of $1½ per share is payable on July 10 on the common stock, for the quarter ending June 30.

NORTH BROKEN HILL CO.—Dividend No. 74 of 2s. per share, less income tax, has been declared payable on June 29 to shareholders on the register on June 2.

YORKSHIRE DYEWARE AND CHEMICAL CO.—The profits for the year ended March 31 were £23,102, and £1,228 was brought forward. Debenture interest absorbed £4,104. A final dividend of 12½ per cent. is proposed, making 15 per cent. for the twelve months, and carrying forward £2,226.

CELANESE CORPORATION OF AMERICA.—A quarterly dividend of 1¾ per cent. has been declared on the 7 per cent. cumulative series prior preferred stock, payable on July 2, and a semi-annual dividend of 3½ per cent. on the 7 per cent. cumulative first participating preferred stock, payable on June 30.

OFFICE CHERIFIEN DES PHOSPHATES.—It is announced from Tangier that this Government Department, which deals with the phosphates monopoly, have published their accounts for the year 1927, showing a net profit earned of 89,500,000 f.

POTASH INDUSTRY CO. OF BERLIN.—The company is to pay a 12 per cent dividend for the past year. The board has decided to recommend an increase of capital by £4,000,000 bringing the total up to £10,000,000. The money, it is stated, will be used for extending activities, especially with regard to the production of nitrogen and the manufacture of mixed fertilisers.

EASTERN SMELTING CO.—An interim dividend of 5 per cent. on the preferred ordinary shares and an interim dividend of 5 per cent. on the ordinary shares (both less income-tax) have been declared, payable June 22 next. Last year there was no interim on the ordinary, a dividend of 15 per cent. being paid for the whole period. In addition, there was a scrip bonus in ordinary shares on a one-in-two basis to both preferred ordinary and ordinary shareholders.

MINERALS SEPARATION.—The directors recommend that in respect of the year ended December 31, 1927, a dividend at the rate of 12½ per cent. per annum (less income-tax) be paid on June 21, 1928, to shareholders registered on the books on June 14, and have also resolved that an interim dividend in respect of the year ending December 31, 1928, at the rate of 5 per cent. per annum (less income-tax) be paid on June 21, to shareholders registered on the books on June 14.

PEASE AND PARTNERS (LTD.).—The accounts for the year ended March 31 show a loss, after providing for bad debts, maintenance of collieries and other works standing idle, of £106,345. Debenture interest and sinking fund charges required £83,075 and depreciation of plant £38,931. The adverse balance of £609,667 brought forward was thus raised to £838,019. The directors intend during the coming year to submit to the shareholders proposals for a re-arrangement of the capital.

Tariff Changes

SPAIN.—Provision has been made for the establishment of a State control of the distribution and sale of narcotic drugs in Spain, Spanish colonies, and Spanish possessions.

UNION OF SOUTH AFRICA.—Import into the Union of certain bone fertilisers or farm food containing meat meal, bone meal, blood meal, is prohibited except under certain conditions of manufacture.

The Uses of Aluminium

THE BRITISH ALUMINIUM CO., LTD., has just added to its list of publications a small pamphlet on "Railway and Tramway Rolling Stock" (No. 307 of its series). In this, the reduction of dead weight in rolling stock by the use of aluminium for panelling, mouldings, ceilings and fittings is discussed. In addition, aluminium finds considerable application in electrical equipment. The pamphlet consists largely of photographs, which, more impressively than could be done by any words, show advantages accruing to the transport industries by the use of this light metal.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to June 16, 1928.

Registration of this Trade Mark shall give no right to the exclusive use of the letters "B.D.C." or of the word "Hexagon."

476,720. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester; manufacturers. January 14, 1927. (To be Associated. Sect. 24.)

476,721. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. British Dyestuffs Corporation, Ltd.

476,722. Class 3. Chemical substances prepared for use in medicine and pharmacy. British Dyestuffs Corporation, Ltd.

476,723. Class 4. Raw, or partly prepared, vegetable, animal and mineral substances, used in manufactures, not included in other classes. British Dyestuffs Corporation, Ltd.

476,727. Class 47. Preparations of sulphonated oils, for use as detergents. British Dyestuffs Corporation, Ltd.

"DROPS."

487,613. Class 1. Sodium sulphide, caustic alkalies and alkali bisulphate, all being chemical substances. Rhenania Kunheim Verein Chemischer Fabriken Aktien-Gesellschaft (a corporation organised under the laws of Germany), 10 Reichstagsufer, Berlin, N.W.7, Germany; manufacturers. January 16, 1928. (To be Associated. Sect. 24.)

487,614. Class 2. Sodium sulphide, caustic alkalies and alkali bisulphate, all being chemical substances. Rhenania Kunheim Verein Chemischer Fabriken Aktien-Gesellschaft, etc., etc.

"EMULPHOR."

488,549. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktien-Gesellschaft (a joint stock company organised under the laws of Germany), Mainzerlandstrasse 28, Frankfort-on-Main, Germany; manufacturers. February 15, 1928.

"ERIDAN."

488,551. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktien-Gesellschaft, etc., etc.

International Testing Materials Association

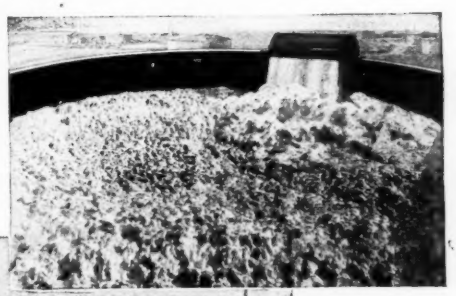
THE International Association for Testing Materials, which was active for some years prior to the war, provided valuable opportunities, through periodical congresses, for the interchange of ideas on the part of all those engaged in the production and control of structural material. Following a conference at Amsterdam in September, 1927, arrangements have been made to form a British section of what will be known as the New International Association for Testing Materials, and which will have its next Congress at Zurich at a date to be fixed later. It may be noted that questions of the actual standardization of materials, and the formulation of specifications, are excluded from the scope of this new body, but there is no doubt that the periodical congresses will do much to secure and promote that agreement between the nations on which alone international specifications can be based. Dr. W. Rosenhain has been appointed British representative on the permanent committee, and Mr. G. C. Lloyd hon. secretary and treasurer of the British Section.

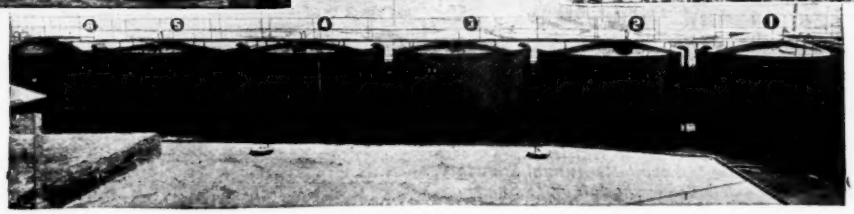
Protecting moderate size oil storage tanks

The Foamite Generator System

[Patented]

The standards which form the basis for determining the efficiency of the various parts which go to make up the Foamite Generator System have been firmly established by long successful service records in actual working conditions.





IN the Foamite Generator System, Firefoam is produced with the Foamite Foam Generator by introducing Foamite Generator Powder into a stream of flowing water. The Generator is located at a distance from the burning tank, and the Firefoam is carried to the tank through fixed piping and is discharged on to the burning liquid from a discharge chamber that is fastened to the tank.

The operation of this system is simplicity itself. A hóse connection is all that is needed from the water supply to the inlet side of the Generator, which is set up near the Generator Connection Stand. Another length of hose connects the outlet side of the Generator to the Generator connection leading to the burning tank. The Generator is then operated in the usual manner. Genuine Firefoam is thus discharged on to the surface of the burning oil in adequate quantity and at correct rate of flow through a discharge chamber similar to those used so successfully with the Foamite (Two Solution) Systems.

Full particulars of the Foamite Generator Installation, which dispenses with the large solution storage tanks, can be obtained from Foamite Firefoam Limited, 55–57 Great Marlborough Street, London, W.1.

Foamite Fire Protection

A Complete Engineering Service

Against Fire

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

ELLIS, Thomas, and ELLIS, William (trading as WILLIAM ELLIS), 291, Derby Road, Bootle, and at Princes Street, Bootle, manufacturers of paints, etc. (C.C., 2/6/28.) £27 7s. 8d. April 27.

Bill of Sale

MATCHET, Andrew Sneddon, 97, Rocky Lane, Monton, Manchester, analytical chemist. (B.S., 2/6/28.) Dated May 22, filed May 25. £78 10s.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ACME CHEMICAL CO., LTD., Tonbridge. (M., 2/6/28.) Reg. May 10, £640 debentures; general charge. *£3,000. June 6, 1927.

CRITCHLEY BROS. (DYERS), LTD., Pendleton. (M., 2/6/28.) Reg. May 10, £10,000 debentures; general charge. *£20,500. June 29, 1927.

SOUTHERN SILICA, LTD., Melksham. (M., 2/6/28.) Reg. May 12, £300 1st debentures, part of £8,000; general charge. *£2,100. December 21, 1927.

Satisfaction

LEVER BROTHERS, LTD., Port Sunlight, soap manufacturers. (M.S., 2/6/28.) Satisfaction reg. May 14, £21,700, part of amount reg. April 13, 1921.

London Gazette, &c.

Companies Winding Up Voluntarily

TETMAL, LTD. (C.W.A.T., 2/6/28.) F. H. Parrott, C.A., 4, Southampton Row, London, W.C.1, appointed as liquidator, May 21. Meeting of creditors at the offices of Derbyshire and Co., 4, Southampton Row, Kingsway, London, W.C.1, on Wednesday, June 6, at 11 a.m.; creditors claims by July 11th.

TUBBS AND CO., LTD. (C.W.U.V., 2/6/28.) T. G. Piper, Chartered Accountant, Bush Lane House, Cannon Street, London, E.C.4, appointed as liquidator, May 21.

New Companies Registered

INTERNATIONAL BITUMEN EMULSIONS, LTD.—Registered as a "public" company on May 21. Nom. capital, £350,000 in 5s. shares. To acquire the undertaking and assets of Bitumen Emulsions, Ltd., and G. S. Hay and Co., Ltd.; to adopt two agreements with Howard C. Back; to manufacture, refine, sell, purchase or deal in tar or bitumen, etc., and to carry on the business of manufacturing chemists, chemical manufacturers, manufacturers of and dealers in emulsions of all kinds, etc. A subscriber: G. Speechley, 16, Langham Road, West Green, London, N.15.

TOM LEES AND CO., LTD. Registered May 25. Nom. capital, £6,500 in £1 shares (3,300 7 per cent. cumulative preference and 3,200 ordinary). To acquire the business of dyers carried on by Tom Liversidge and Sons, Ltd., of Canal Dyeworks, Leeds Road, Huddersfield, at Thurstin Dyeworks, Honley, nr. Huddersfield, and lately carried on by Farrar and Co. (Honley), Ltd.; to acquire all or any of the assets of the business of a dyer carried on by Tom Lees at Dobroyd Dyeworks, New Mill, nr. Huddersfield, etc. A director: Tom Lees, Whyngarth, Longwood, Huddersfield.

MUSKER PULVERIZED COAL SYNDICATE, LTD. Registered May 23. Nom. capital, £2,500 in £1 shares. To adopt an agreement with A. Musker; to acquire and turn to account any invention relating to the carbonisation or distillation of coal, shale, slack, bitumen, peat and other minerals and mixtures, etc. A subscriber: A. Musker, 301, Abbey House, Westminster, London.

Thomas Recording Gas Calorimeter

Fuel Research Report Published

THE Department of Scientific and Industrial Research has published Fuel Research Technical Paper No. 20 (H.M. Stationery Office, pp. 42, 9d.), entitled *The Thomas Recording Gas Calorimeter*. From time to time ivestigations are carried out at H.M. Fuel Research Station and elsewhere into the performance of various instruments used in connection with the treatment or utilisation of fuel. A report was published in 1921 on the Simmance recording calorimeter. Other reports on calorimeters, CO_2 recorders, etc., are in course of preparation.

The present report describes an exhaustive investigation, carried out at H.M. Fuel Research Station, of the behaviour of the Thomas Recording Gas Calorimeter. This instrument was originally made by the Cutler Hammer Co., of New York, and the first instrument tested was made by that firm. The tests on this instrument carried out at the request of the Cambridge Instrument Co., indicated that the principle on which it worked was sound, but brought to light certain defects, mainly in the recording mechanism. The Cambridge Instrument Co. then re-designed certain portions of the instrument, which was again tested, and it was found that the main defects had been satisfactorily overcome, but minor modifications were still required. Further modifications were made and found successful. The final results and conclusions are summarised in the report, and apply to the present form of the instrument. These show that if properly installed and adjusted, and given reasonable care in maintenance, it should give a reading, when working on a gas of steady calorific value, correct to ± 1 B.Th.U. There is a time lag before correct indications are given of a change in calorific value, and when rapid fluctuations occur their full extent is not indicated, but the mean value recorded is correct.

As those tests of the original pattern which gave satisfactory results were not repeated, it is necessary, in reporting on the work, to describe the tests in the order in which they were carried out, and in reading the detailed report it should be borne in mind that the defects indicated by the earlier tests have been remedied in the latest pattern instrument.

The investigation was carried out by Mr. A. Blackie, with the assistance of Messrs. C. W. Ockelford, C. Baker, and J. S. Hales. The analytical work was supervised by Mr. D. MacDougall. The course of the investigation was guided by Dr. J. G. King, the chief chemist of H.M. Fuel Research Station.

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